PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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Hoffman -

B-1081-1091-1111-1121-3061-3071-3101-3114
M-1091-1111-1121-3061-3071-3101-3114
P 1121-3071-3091-3101-3114-
SP 3061-W.1087-W1111-W1121-W3061-W3071
W3101-W3114 (Ch. 321-322)

318-155

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 299

Emerson Models 1102D, F, 1104F, H, J, L, 1105D, 1106H, J, L, N, P, R, 1107D, F, 1114D, F, H, L, 1115D, 1128F, 1130D, F, 1132F, 1142D and 1143D were covered in Photofact Folder 4 - Set 299.

Many new models and late production changes are added with the publication of this bulletin.

Following is a complete list giving model, chassis, picture tube and tuner used in each set.

MODEL	CHASSIS	PICTURE TUBE	TUNER
1062L	120245-N	17LP4	470818
1102D	120245-D	17LP4	470786
1102F	120245-N	17LP4	470818
1102H	120245-H	17LP4	470850
1104F	120256-D	21YP4	470803
1104H	120256-H	21YP4	470809
1104J	120256-F	21YP4	470798
1104L	210256-N	21YP4	470817
1104N	120256-P	21YP4	470824
1105D	120275-L	21YP4	470810
1106H, J	120255-D	21AUP4A	470803
1106L, N	120255-F	21AUP4A	470798
1106P, R	120255-H	21AUP4A	470809
1106T, V	120255-P	21AUP4A	470824
1107D, F	120269-L	21AUP4A	470810
1114D	120259-D	21AUP4A	470803
1114F	120259-F	21AUP4A	470798
1114H	210259-N	21AUP4A	470817
1114J	120259-P	21AUP4A	470824
1114L	210259-H	21AUP4A	470809
1115D	120276-L	21AUP4A	470810
1118D	120255-P	21AUP4A	470824
1119D	120269-L	21AUP4A	470810
1128F	120273-F & 120272-B	21AUP4A	470798
1128H	120273-P & 120272-B	21AUP4A	470824
1130D	120245-D	17LP4	470786
1130F	120245-N	17LP4	470818
1132F	120256-F	21YP4	470798

EMERSON CHASSIS 120244-P, 120245-D, -H, -N, 120255-D, -F, -H, -P, 120256-D, -F, -H, -N, -P, 120259-D, -F, -H, -N, -P, 120269-L, 120272-B, 120273-F, -P, 120275-L, 120276-L, 120288-N

PRODUCTION CHANGES
BULLETIN 156

PRODUCTION CHANGES
BULLETIN 156

PROPERTY OF
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3324 MEADE ST.
DENVER, COLORADO

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	1132H	120256-P	21YP4	470824
	1142D	120259-F	21AUP4A	470798
	1142F	120259-P	21AUP4A	470824
	1142H	120259-D	21AUP4A	470824
	1143D	120276-L	21AUP4A	470810
	1146D	120244-P	14HP4	470841
	1148D	120259-P	21AUP4A	470824
	1148F	120259-D	21AUP4A	470803
	1149D	120276-L	21AUP4A	470810
	1168A	120288-N	14HP4	470857

Ch.120244-P

CHASSIS AND TUNER IDENTIFICATION

Chassis 120244-P is similar to chassis 120245-D, except for tuner , picture tube and an additional lid actuated "on-off" switch.

Ch.120288-N

Chassis 120288-N is similar to chassis 120244-P, except that the "on-off" switch is not actuated by a lid and uses a different tuner.

Ch. 120245-H

Chassis 120245-H is similar to chassis 120245-D, except a different tuner is used.

Ch. 120255-P

Chassis 120255-P is similar to chassis 120255-D, except a different tuner is used.

Ch. 120256-P

Chassis 120256-P is similar to chassis 120256-D, except a different tuner is used.

Ch. 120259-P

Chassis 120259-P is similar to chassis 120259-D, except a different tuner is used.

Ch. 120273-P

Chassis 120273-P is similar to chassis 120273-F, except a different tuner is used.

Tuners 470841 and 470824 are electrically identical; the only difference being in shaft length. A schematic of this tuner is given in Fig. 1.

Tuner 470850 is electrically identical to tuner 470809. Different part numbers are used due to difference in shaft length.

Tuner 470857 is electrically identical to tuners 470817 and 470818 . Different part numbers are used due to difference in shaft length.

The following production changes were made during production and apply to the chassis so designated.

TO ELIMINATE AUDIO BUZZ

The first and second video IF amplifier circuit has been revised to eliminate audio buzz under very strong signal conditions.

L9 was changed to part #720233.

A partial schematic is given in Fig. 2 showing the revised circuit.

Chassis incorporating the above changes are coded as follows:

120244-P	B	120259-N	A
120245-H	A	120259-P	A
120245-N	A	120273-P	A
120255-P	A	120276-L	B
120256-P	A		

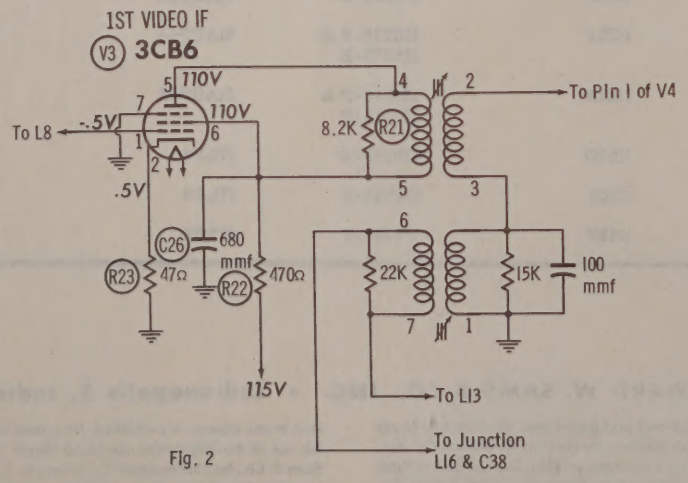


Fig. 2

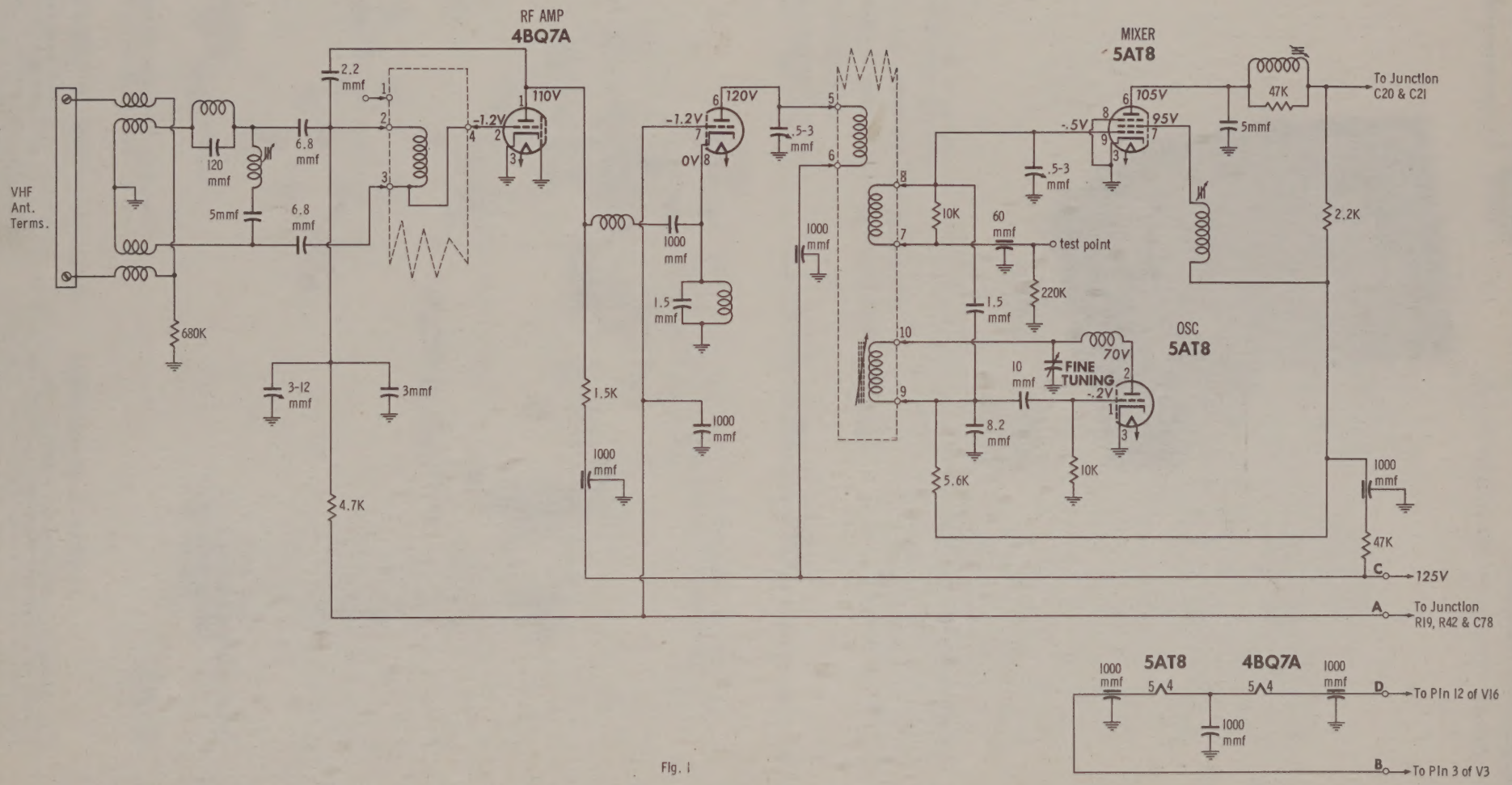
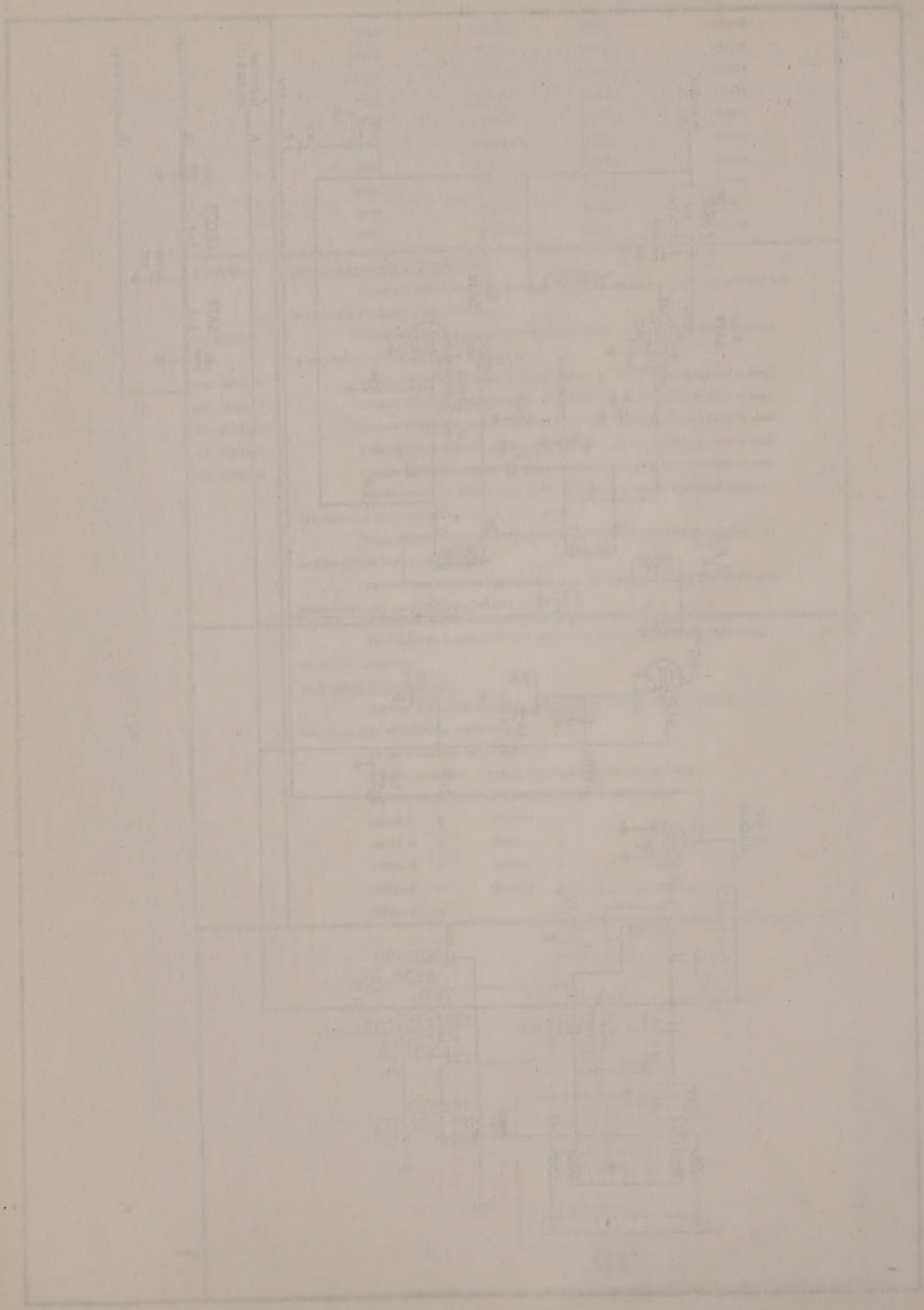

RF AMP
4BQ7A
MIXER
5AT8
OSC
5AT8
VHF
Ant.
Terms.
680K
120
mmf
5mmf
6.8
mmf
6.8
mmf
2.2
mmf
3-12
mmf
3mmf
4.7K
110V
-1.2V
120V
-1.2V
0V
.5-3
mmf
1000
mmf
1.5
mmf
1.5K
1000
mmf
1000
mmf
105V
-.5V
95V
47K
To Junction
C20 & C21
5mmf
.5-3
mmf
10K
60
mmf
test point
2.2K
220K
1.5
mmf
70V
10
mmf
FINE
TUNING
-.2V
8.2
mmf
5.6K
10K
1000
mmf
47K
C
125V
A
To Junction
R19, R42 & C78
1000
mmf
5AT8
4BQ7A
1000
mmf
5∧4
5∧4
D
To Pin 12 of V16
1000
mmf
B
To Pin 3 of V3

Fig. 1



AIRCASTLE MODEL 652.3D5-S

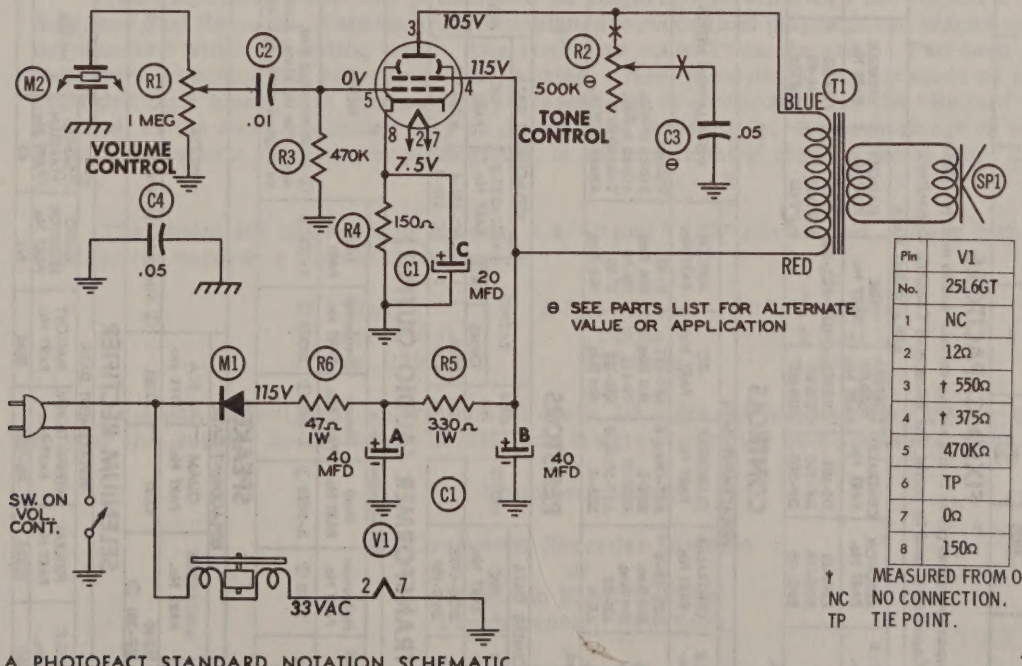
AIRCASTLE MODEL 652.3D5-S

TRADE NAME	Aircastle Model 652. 3D5-S
SUPPLIER	Spiegel Inc., 1061 W. 35th St., Chicago 9, Ill.
TYPE SET	AC Operated Phono Amplifier with 3 Speed Manual Record Player
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .35 Amp. @ 117 Volts AC

AIRCASTLE MODEL 652.3D5-S

OUTPUT
V1 25L6GT

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE



Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

Pin No.	V1 25L6GT
1	NC
2	12Ω
3	† 550Ω
4	† 375Ω
5	470KΩ
6	TP
7	0Ω
8	150Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.
TP TIE POINT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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318-2

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		AIRCASTLE PART No.	STANDARD REPLACEMENT	
V1	Output	25L6GT	25L6GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AIRCASTLE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	CE-1000	PRS150V40 4020	BBRT44215	TCT3116	TDL-404020-150	FMT-315	TVA-3448
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.01	400	CP-103-4	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C3	.05	400	CP-503-4	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	Note 1
C4	.05	400	CP-503-4	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRCASTLE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	VC-42	BSK-70-S	A47-1Meg-Z	Q13-137	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R1A.
R2A	500KΩ	½	VC-44	AB-59	A47-500K-S	Q11-133	U-50	Tone-Note 1
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A.

Note 1. Not used in some versions.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRCASTLE PART No.	IRC PART No.	
R3	470KΩ	½	RC-474-1	BTS-470K	
R4	150Ω	½	RC-151-4	BTS-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRCASTLE PART No.	IRC PART No.	
R5	330Ω	1	RC-331-4	BTA-330	
R6	47Ω	1	RC-470-4		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRCASTLE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2KΩ	3.5Ω	Part of Spkr.	Z1101 ①	A-3025 ①	A-3332 ①	26S58 ①	S-12X ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

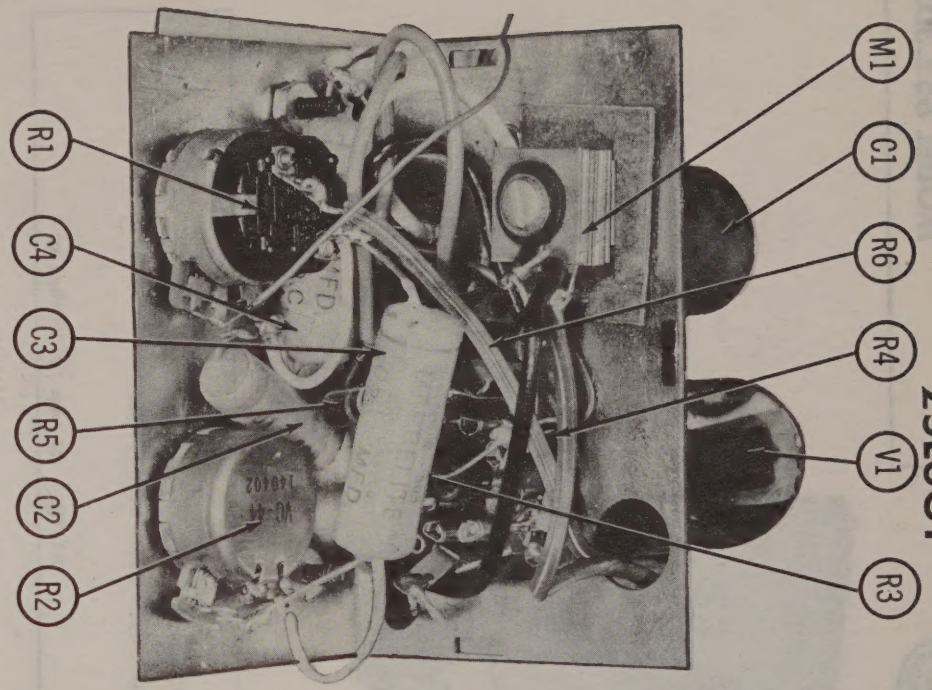
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRCASTLE PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3.5Ω	SP40 SP-3S1 ①	4A07	223S1	① Alternate speaker

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	AIRCASTLE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.037A	SE-1000	1002A	RS-050	6S65	8J1	65	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	AIRCASTLE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2		L-29 * P-29		60 * 2460		* Complete tone arm and cartridge assembly.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	AIRCASTLE PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M3		* J-152 or * J-752	* B-379	* W-14AGA	* Metal

CRESTWOOD MODEL 304

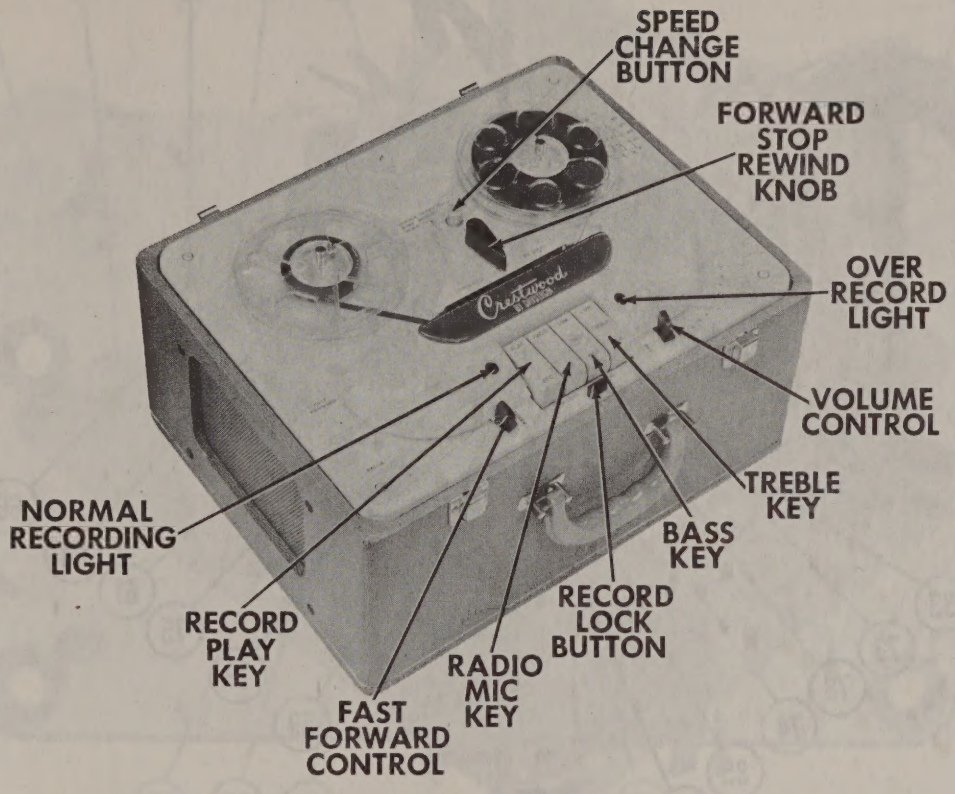


Figure 1

GENERAL INFORMATION

The Crestwood Model 304 is designed for fingertip operation for Fast Forward, Playback, Stop, and Fast Reverse. This recorder is designed to record and playback two tracks of material on standard width recording tape. Any reel size up to 7" can be used. Two neon recording indicators simplify the recording level setting. New recordings can be made on previously recorded tape since it is automatically erased and re-recorded when the "Record" button is pressed, or the same recording may be played back indefinitely. Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from the microphone.

The Model 304 has two tape speeds, 3 3/4" and 7 1/2" per second. Using both tracks of the tape the recording time is as follows:

Size	3 3/4" Speed	7 1/2" Speed
5" reel (600 ft.)	1 hour	1/2 hour
7" reel (1200 ft.)	2 hours	1 hour

This unit is designed to operate on 60 cycle, 115 volts, AC supply only. Before connecting to your line supply, be absolutely certain that it agrees with the above specifications.

Manufactured by:

Crestwood Recorder Division
of
Daystrom Electric Corp.
Poughkeepsie, New York

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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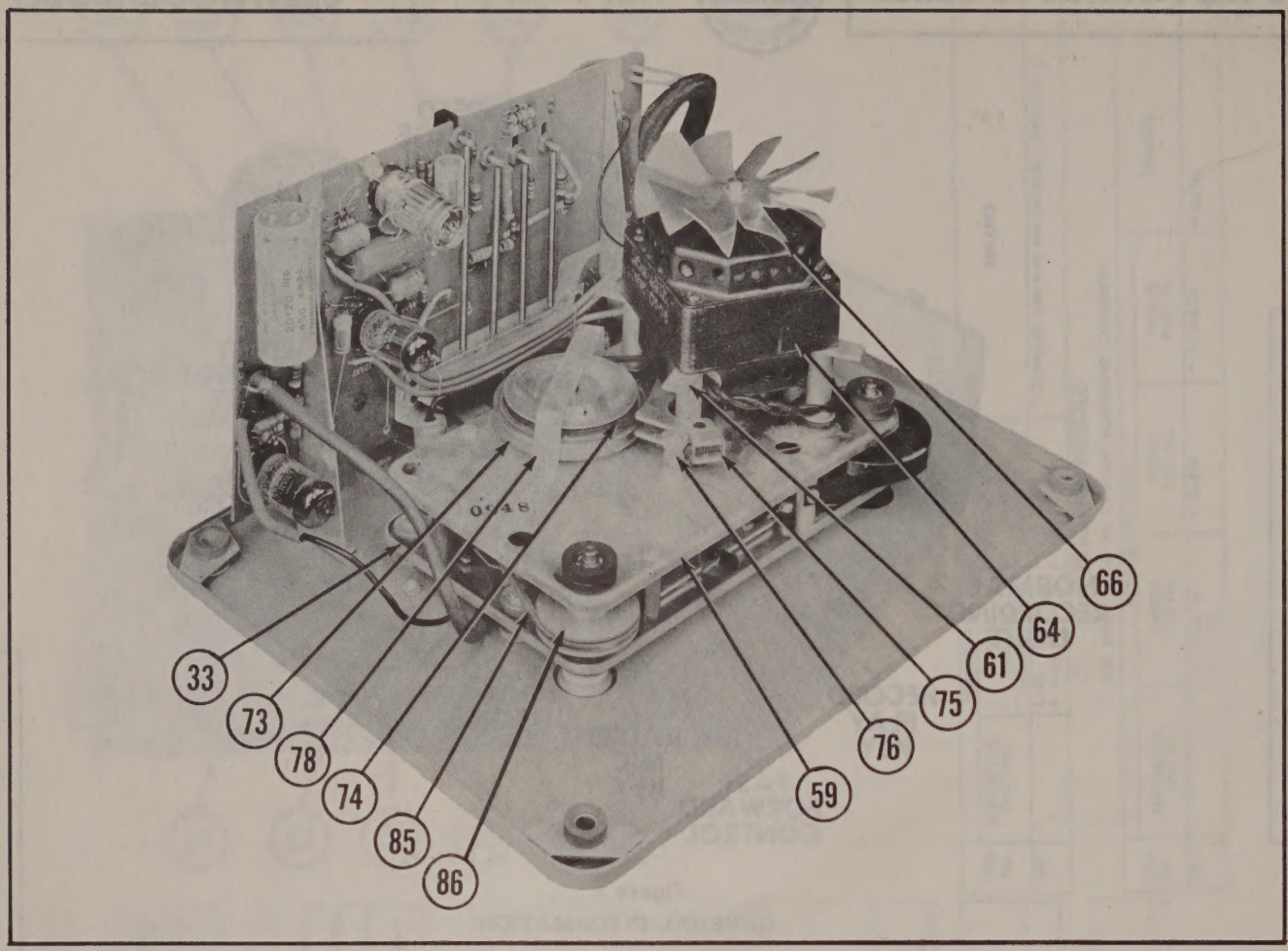


Figure 2

Specifications Of Model 304

Size Portable Unit: 7 1/2" x 12" x 15 1/2".

Weight: Approximately 24 lbs.

Tape Speed: 7 1/2" per second and 3 3/4" per second.

Track: Dual

Maximum Reel Size: 7"

Tape Wind: "A"

Track Selection: Manual Turnover.

Fast Rewind Speed: 20 times faster than speed setting.

Bias And Erase Frequency: 75KC

Wow And Flutter: 0.3% or lower at 7 1/2" per second.

Input Sensitivity: Microphone .002 volts, Radio .020

Erase Current: 6 to 8MA.

Bias Current: .6 to .7MA.

Inputs: Radio, Phones and Mic rear of unit.

OPERATING INSTRUCTIONS

Preparing The Crestwood For Recording-

1. Plug the AC power cord socket into the AC receptacle on the rear panel of the recorder case and insert the AC power cord into a convenient 105 - 120 volts, 60 cycle AC outlet.

2. The 304 recorder is a complete tape recorder and playback system. However, the sound of your Crestwood will be measurably improved by connecting it to a high fidelity speaker system, or to a high fidelity amplifier speaker system. Model 304 has separate output jacks so that the recorder amplifier can be bypassed or not, as desired, when connecting to a high fidelity system.

Threading The Tape-

1. Place reel of tape on the right hand spindle so that the tape will lead off in a clockwise direction.

NOTE: This recorder uses Type "A" wound tape, i.e. the dull or magnetic coated side faces inward on the reel. If the tape used is Type "B" (coated side facing outward) the recording will be made at a very low sound level and the playback will be almost inaudible.

2. Place an empty reel on the left hand spindle. Be sure that both reels are fully seated and engaged with the drive pins on the spindles.

3. Unwind about 14 inches of tape. Hold a section of tape straight with both hands and insert the tape

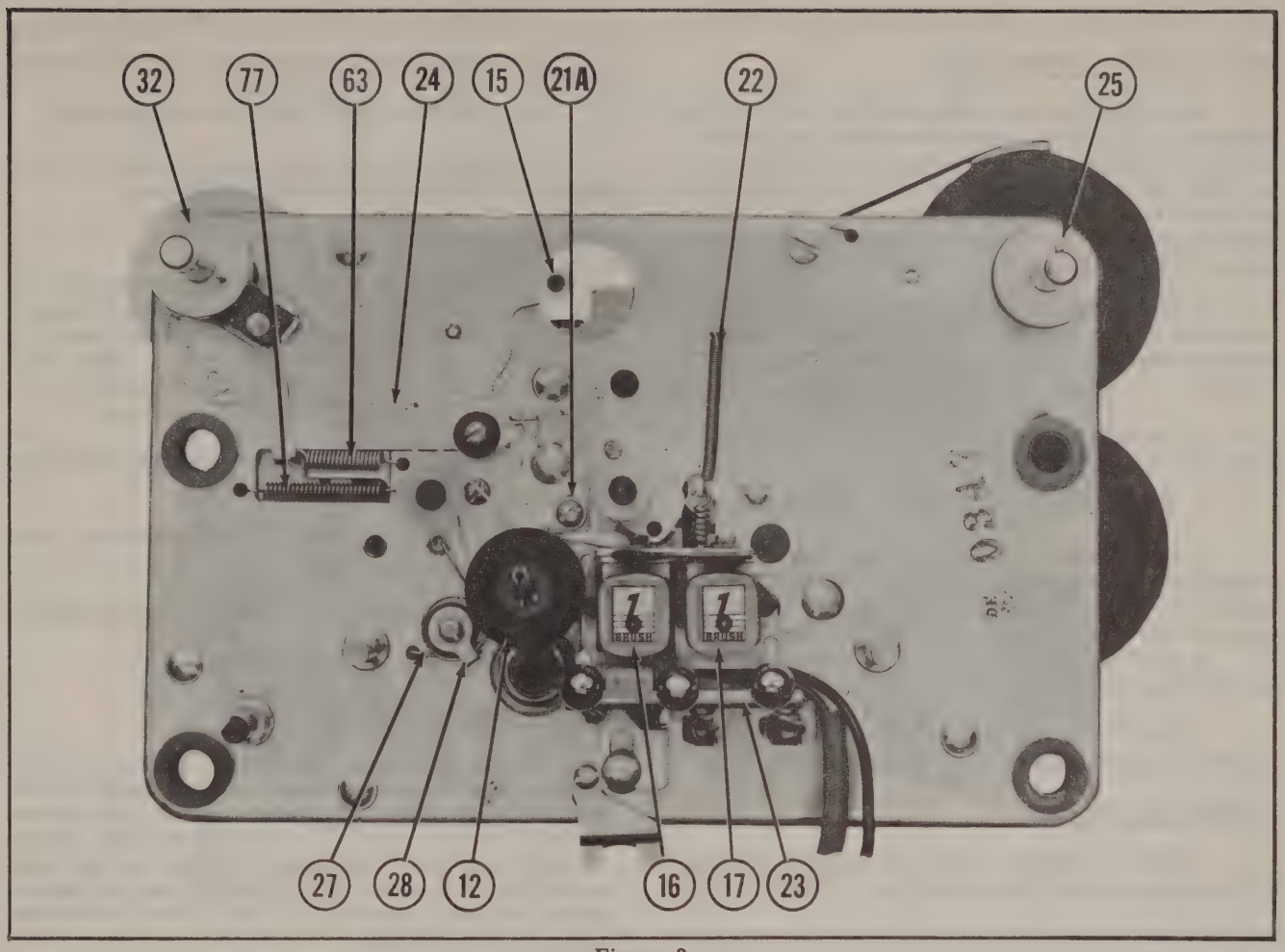


Figure 3

into the tape slot. Feed the free end of the tape into one of the three radial slots in the hub of the empty reel. Turn the reel in a clockwise direction until the tape is secured and all slack is taken up between reels .

To Record From Microphone-

1. Insert the microphone plug into the jack marked "Mic" on the back panel.

2. Turn "Volume Control" knob slightly to the right to turn on amplifier. Allow a few seconds for the amplifier tubes to warm up before starting to record.

3. Press the "Mic" button to "Mic".

4. Hold the microphone approximately one foot from lips. Adjust "Volume Control" until the "Normal Recording" light (left) flashes and the "Over-record" light (right) flickers only at the very peaks of sound. The unit is now set to record.

5. Hold "Press To Record" button down and turn the forward-reverse knob (1) to "Forward". The "Press to Record" button will now stay depressed in record position.

NOTE: Be certain fast forward control lever (7) is in "Normal" position. If not, the mechanism will not operate.

To Record From Phonograph-

Mic input is suitable for high fidelity record players with magnetic cartridges. The quality of the recording from microphone will depend on the quality of the microphone used. Records recorded on tape by connecting the magnetic cartridge directly to the "Mic" input may be equalized during tape playback by setting touch tone Bass and Treble controls to desired tonal response. Most crystal or magnetic type phonograph have a standard phono plug that can be plugged directly into the "Radio TV Jack", otherwise, the "Audio Connecting Cable", supplied with the recorder, can be used as follows:

1. Insert the cord plug into the "Radio TV Jack".

2. Connect the cord clips on the pickup leads on the phonograph.

NOTE: Should a hum develop from this connection, reverse the cord clips on the pickup leads.

3. Hold "Press To Record" button down and turn forward-reverse knob (1) to "Forward". The "Press To Record" button will now stay depressed in record position. Start record to be recorded at desired starting point.

NOTE: Be certain fast forward control lever (7) is in "Normal" position. If not, the mechanism will not operate.

4. Adjust "Tone" control to desired position.

To Record From Radio Or TV-

Recordings can be made from a radio or television receiver by placing the microphone near the speaker ; however, this type of recording may not be satisfactory as other sounds may be picked up by the microphone which as a result will be recorded on the tape. A higher quality recording can be made by using a shielded cable equipped with a phono plug, connected as follows:

1. Insert phono plug into Radio-TV jack. Connect other end of shielded cable across output of radio receiver or across voice coil connections on radio or TV speaker.

2. Move "Volume Control" lever slightly to the right to turn on the amplifier.

3. Press "Radio Mic" button to "Radio" position.

4. Start radio or TV playing and adjust "Volume" control until normal recording light (left) flashes and the over — record light (right) flickers only at the very peaks of sound.

5. Hold "Press To Record" button down and turn forward-reverse lever (1) to Forward.

6. The "Tone" control is automatically disconnected when unit is in record radio position.

To Stop Tape Movement-

1. Tape movement may be stopped at any time by turning forward-reverse knob (1) to "Stop".

NOTE: When the recorder is not in use, forward-reverse knob (1) should be left in the "Stop" position.

Dual Track Operation-

NOTE: Recordings are made on half the width of the tape at one time. Since it is impossible to edit and splice one "track" without affecting the other, recordings which are to be edited should be limited to one track only.

1. After a reel of tape has been recorded, a second track may be recorded on the same reel (without rewinding) by removing the reel from the recorder , turning it over, then placing the full reel on spindle (25) and the empty reel on spindle (32).

2. Thread the tape and proceed with the recording as previously described.

3. After the second track has been recorded, the first track is ready to be played without rewinding, by changing reels as described in Step #1 above.

To Rewind-

To rewind the tape, turn forward-reverse knob to "Rewind" position.

To Play A Recording-

1. Insert the AC power cord into the receptacle at the rear of the unit and the other end in to a wall receptacle of the proper rating. Turn "Volume" control to the "On" position.

2. Press the "Play-Record" button to "Play".

3. Turn forward-reverse knob (1) to "Forward".

4. Adjust "Volume" control to desired level.

5. Adjust "Tone" controls to produce desired balance of high and low frequency response.

Fast Forward-

Any portion of a recording may be skipped, or any recording on a tape may be located in a few seconds by pivoting the fast forward control knob (7) in a clockwise direction. A few seconds of "Fast Forward" is equivalent to several minutes of playing time . The fast forward knob (7) has three positions.

(a)Normal, at which position it must remain at all times, except for "Fast Forward".

(b)Pause is the mid–position that brakes the reels and stops all tape movement.

(c)Fast Forward is the "Fast Forward" position .

ADJUSTMENTS

Pressure Pad Adjustment-

Check adjustment as follows: Thread a short length of tape between pressure pad and heads but not between capstan shaft and pressure roller (12). Place forward-reverse knob (1) in Forward position. Form a loop in the end of the tape in which a spring type scale can be fastened. By pulling on end of spring scale a pressure of from 1 1/4 to 1 1/2 oz. should be required to move tape.

If adjustment is necessary, the pressure can be increased or relieved by loosening screws (23A) that mount the guide assembly (23) to the mechanism, and moving guide assembly (23) toward or away from front of machine. (If sufficient movement of the guide cannot be attained, it may be necessary to remove the guide and increase the length of the slotted holes by filing.)

Record Head (16) Alignment Adjustment-

It is very important that the record head (16) be lined up perfectly with the tape. If it is not, low output, loss of high frequencies or track overlap may result. There are two adjustments to be made. One is the head height. This adjustment is made by turning screws (81) until there is a clearance of 11/64" to 3/16" between the head mounting bracket (20) and the upper mechanism plate (33).

The other adjustment is for output and frequency response. To set this, obtain an alignment tape on which a 3,000 cycle tone has been recorded. If this special tape is not at hand, a fairly satisfactory adjustment can be made by using a tape on which the recording is known to be good. Place the tape on the unit that the head is to be aligned on. Connect an output meter or AC voltmeter across the speaker voice coil. Play the tape and rock the head from side to side, the screw holding the head to the record head bracket (18) will allow you to do this. Notice the variation in the output voltage at the voice coil and tighten the head in the position of the highest output. Make sure the head has not moved up or down while rocking it. After

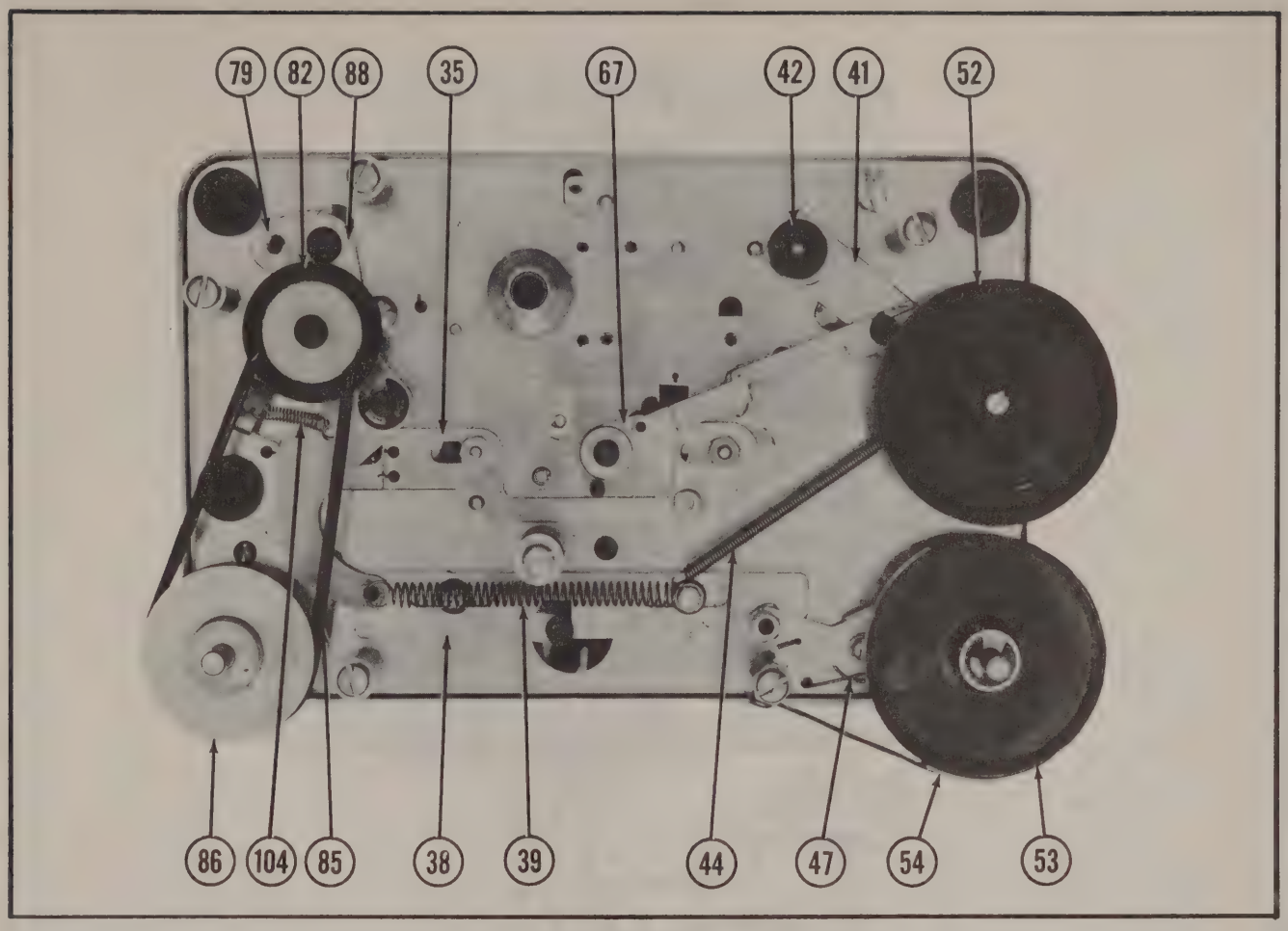


Figure 4

setting the height and output, check unit for track overlap. To do this, take a reel of tape that has no recording on it. Make a recording on the unit that the head has been adjusted on. Do not rewind but take the reel off, reverse them and play the other track. There should be no sound heard. If what was recorded is heard backwards then there is track overlap. If this is the case, recheck adjustments.

Supply Reel Drag Brake Adjustment-

The pressure of the drag brake pad (54) on the supply spindle should be about 40 grams measured with a string around a 2 1/4" reel hub. The hexagonal stud on which the flat spring drag brake (54) is mounted , can be rotated by loosening the lower screw to provide adjustment. Insufficient pressure can cause the tape to climb out from between the pressure roller and capstan or spill from the supply reel when going from forward to stop. Too much pressure may cause flutter.

Fast Forward Brake Adjustment-

The "Fast Forward" brake (49) stops the supply spindle in the pause position and is disengaged in all other positions. The timing sequence between brake release and engagement of the fast forward pulley (86) and flywheel (69) during fast forward is provided by an eccentric roller on the brake bracket which can be rotated by unlocking the nut on the set screw and turning the screw in the appropriate direction.

The brake must release before the fast forward pulley engages the flywheel when going from pause to fast forward.

TROUBLES

Irregular Speed "Wow"-

1. Check capstan and pressure roller (12) for oil or foreign matter. Clean with cloth dipped in Carbon Tetrachloride while running. Check capstan and flywheel assembly (69) for freedom of rotation. If any binding is evident remove same and clean bearing areas on shaft and bearings with clean cloth. (Do not use Carbon Tetrachloride.) Wipe bearing areas with light wax free oil (instrument oil) before replacing.

2. Clean all drive surfaces-motor pulley idlers and flywheel with Carbon Tetrachloride. If idler pulley (52) is not properly engaging flywheel (69) and any indication of scrubbing is evident, replace idler assembly.

3. Check for excessive drag on tape caused by pressure pad on tape guide (23) See "Pressure Pad Adjustment".

4. Check for binds in supply reel shaft (25).

Tape Spillage-

1. Can be caused by glazed or dirty brake and drum surfaces.

2. A stretched take-up belt or brake adjustment may also be at fault. Glazed or dirty brake shoes can be scraped and cleaned with alcohol to restore their effectiveness.

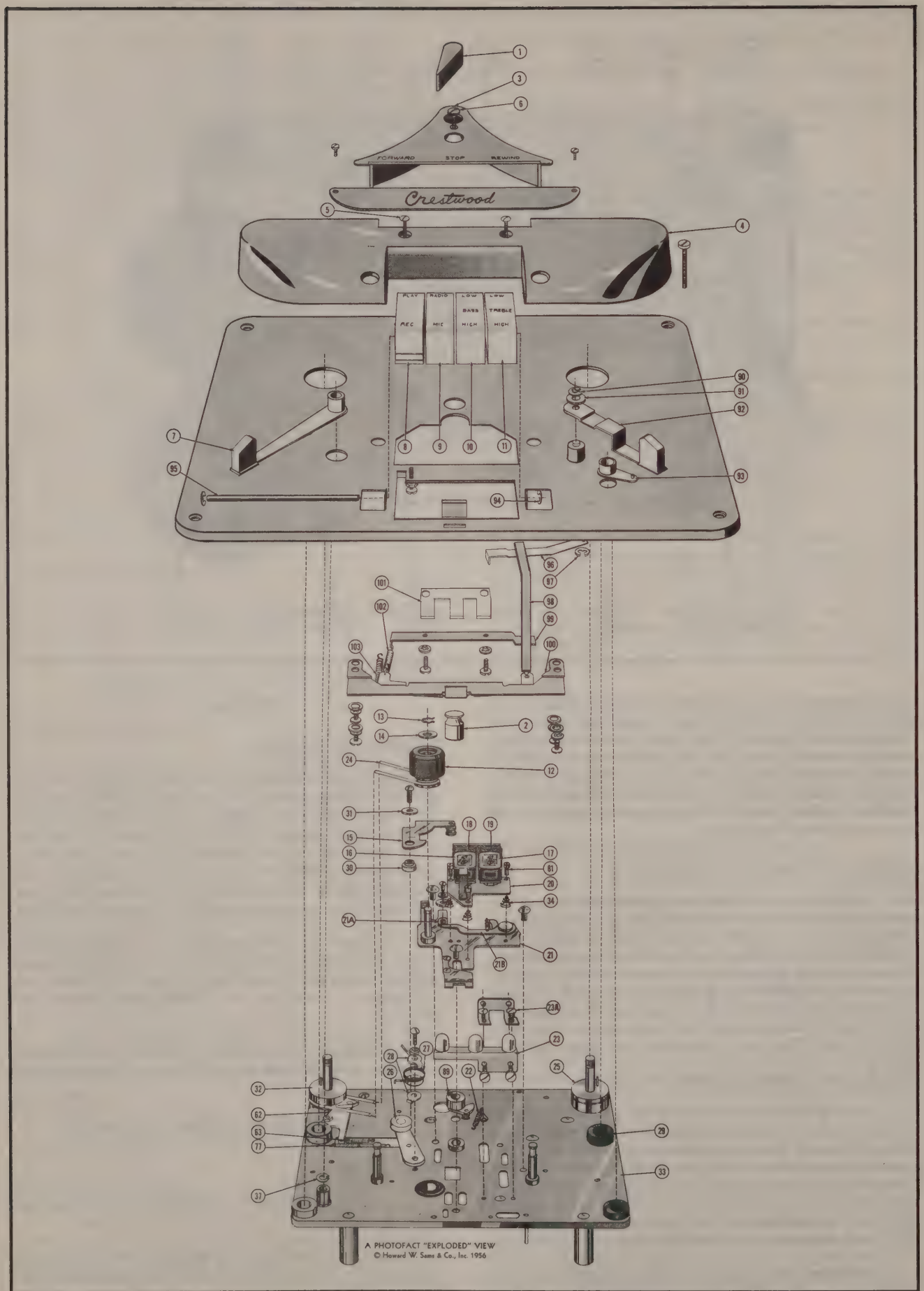


Figure 5A. Exploded View Of Parts Above Baseplate.

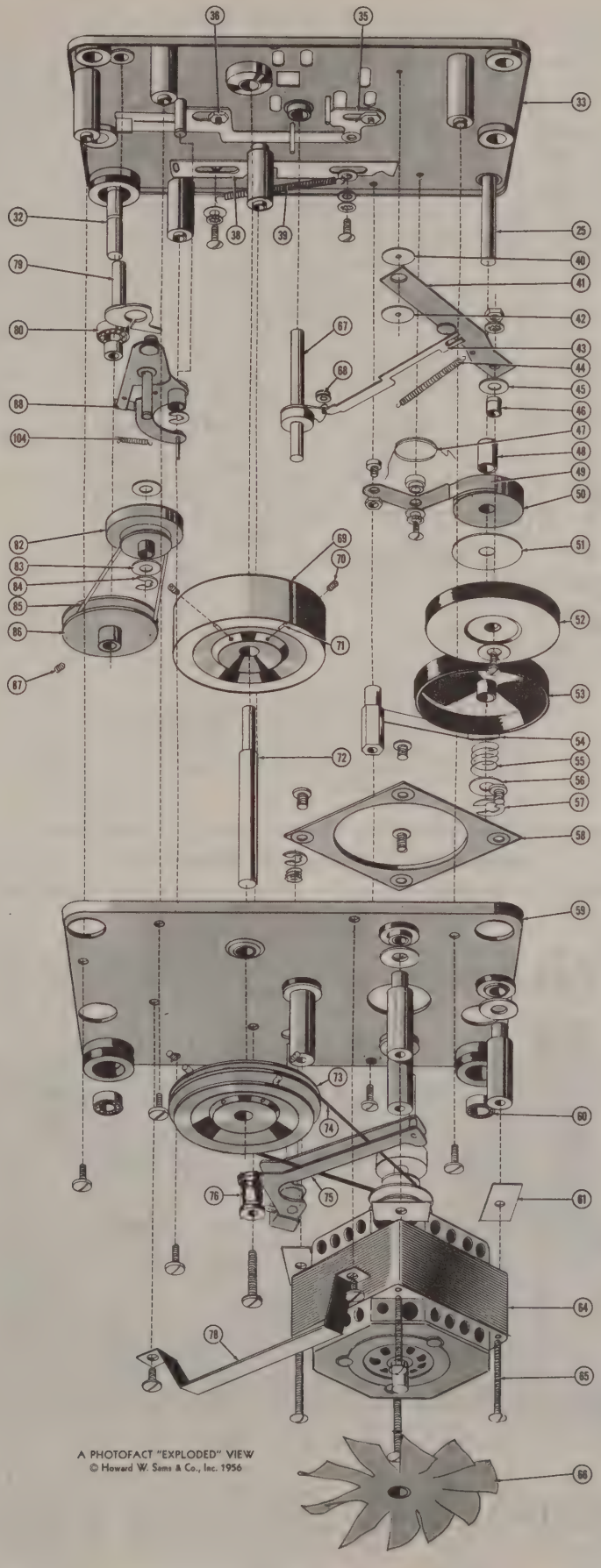
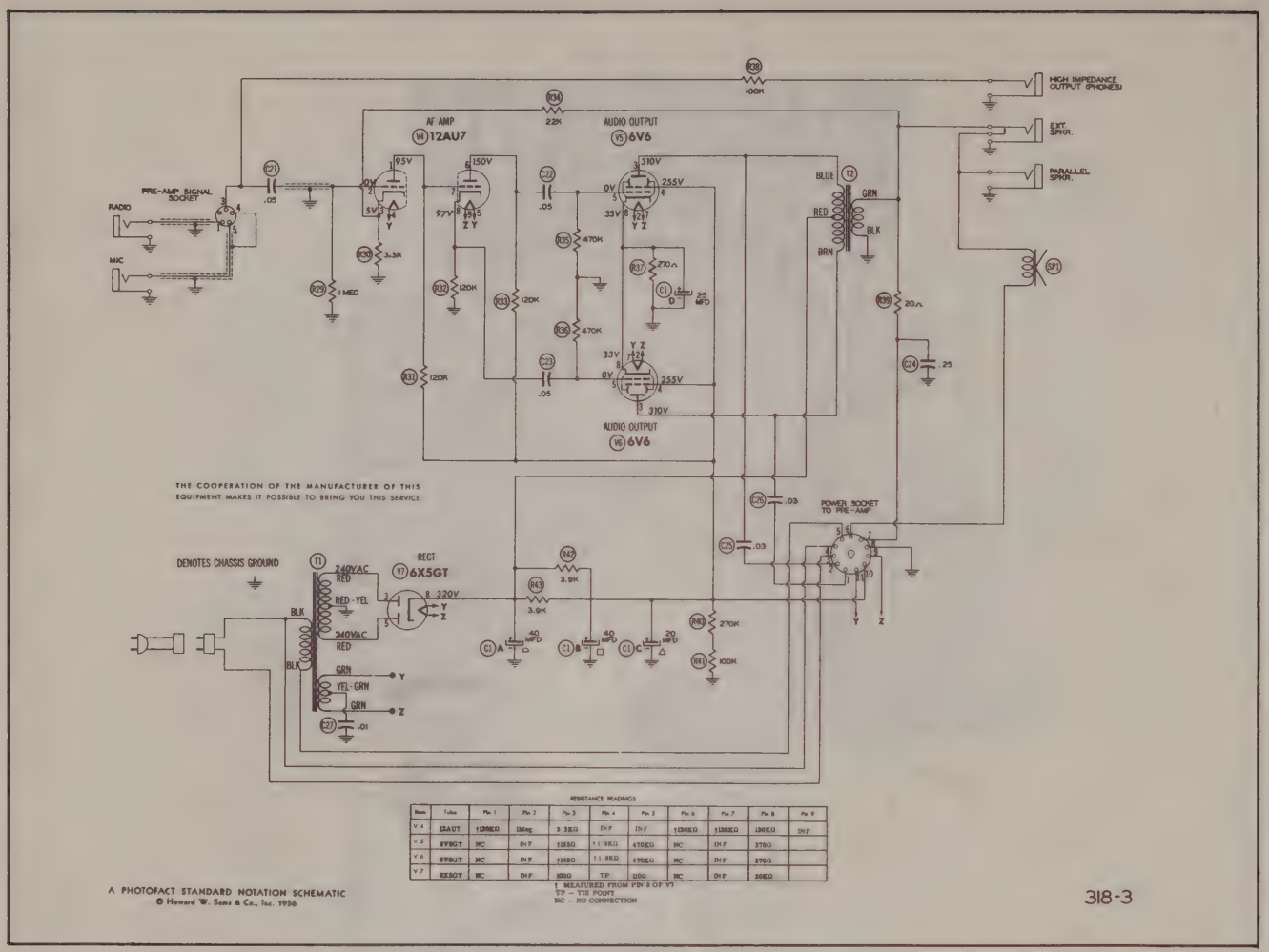
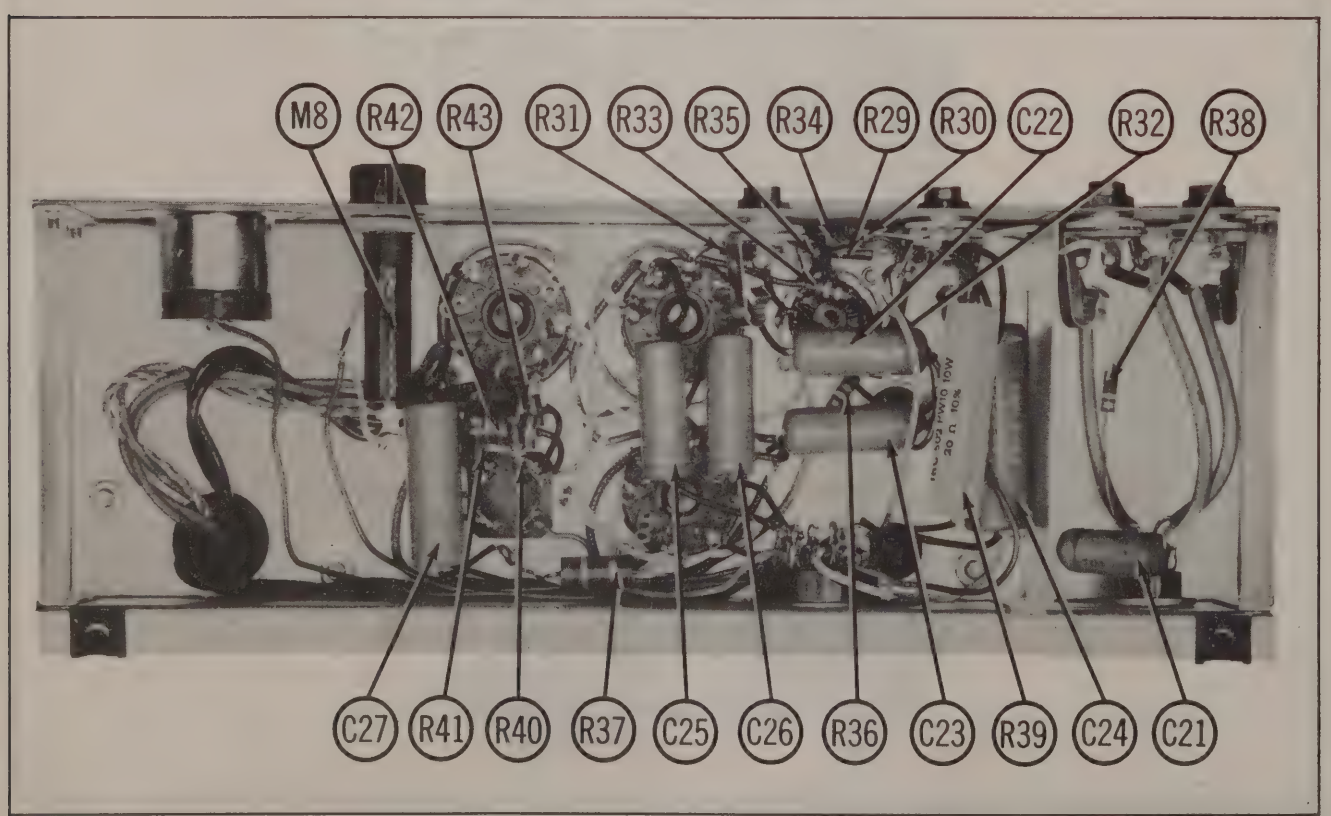


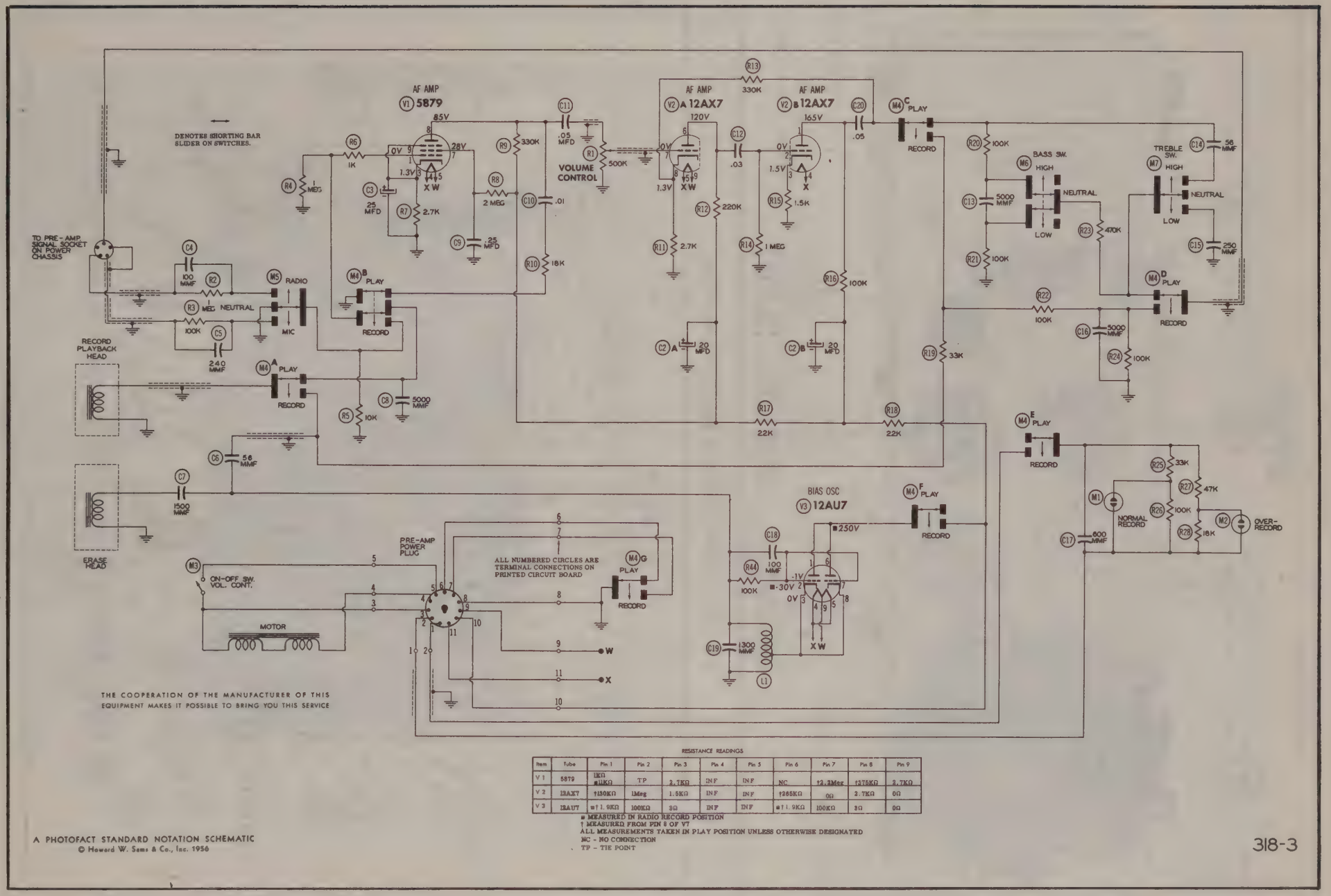
Figure 5B. Exploded View Of Parts Below Baseplate.



Power Supply And Amplifier Schematic.



Bottom View - Model 304 Power Supply And Amplifier.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	5879	1KΩ #1KΩ	TP	2.7KΩ	INF	INF	NC	†2.2Meg	†375KΩ	2.7KΩ
V 2	12AX7	†150KΩ	1Meg	1.5KΩ	INF	INF	†265KΩ	0Ω	2.7KΩ	0Ω
V 3	12AU7	#†1.9KΩ	100KΩ	3Ω	INF	INF	#†1.9KΩ	100KΩ	3Ω	0Ω

MEASURED IN RADIO RECORD POSITION
† MEASURED FROM PIN 9 OF V7
ALL MEASUREMENTS TAKEN IN PLAY POSITION UNLESS OTHERWISE DESIGNATED
NC - NO CONNECTION
TP - TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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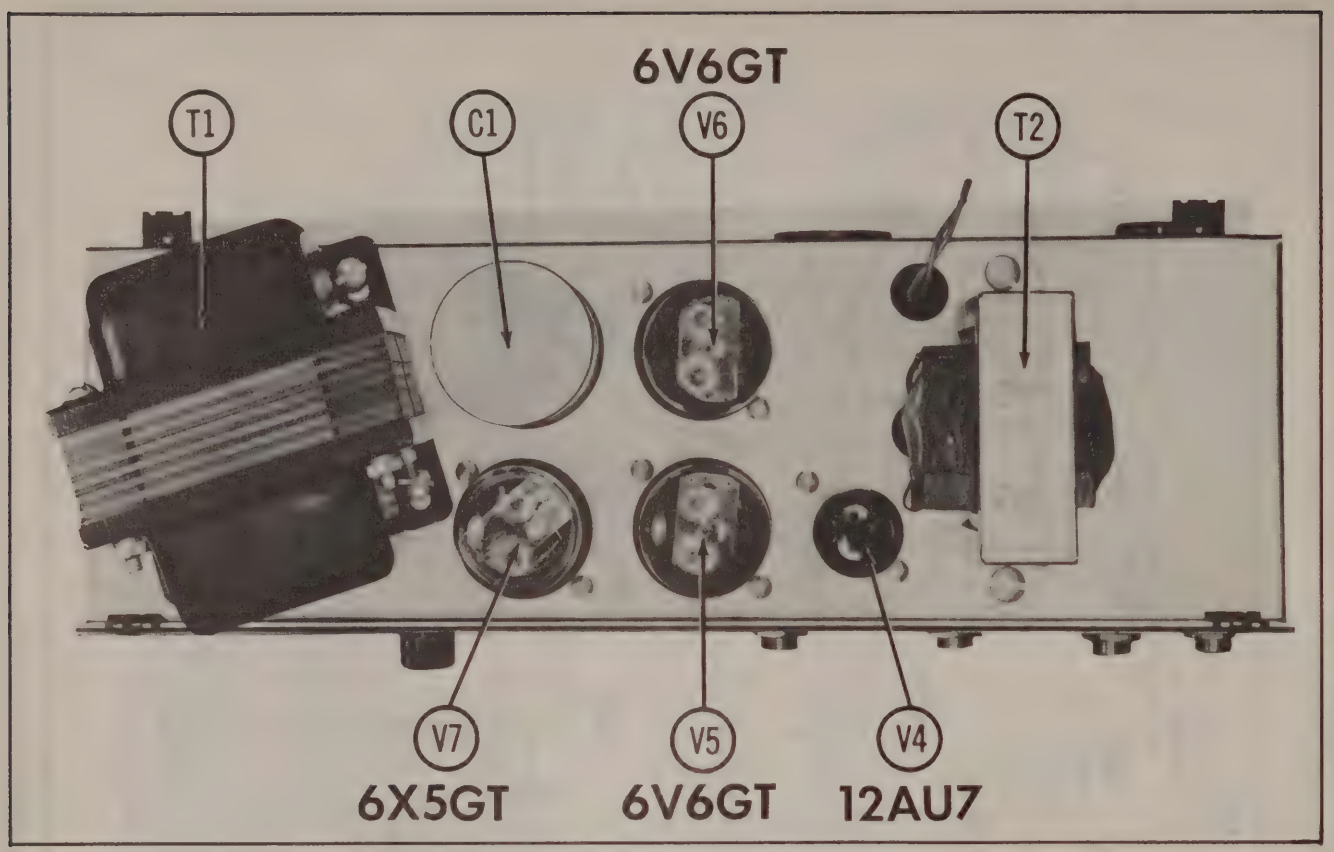
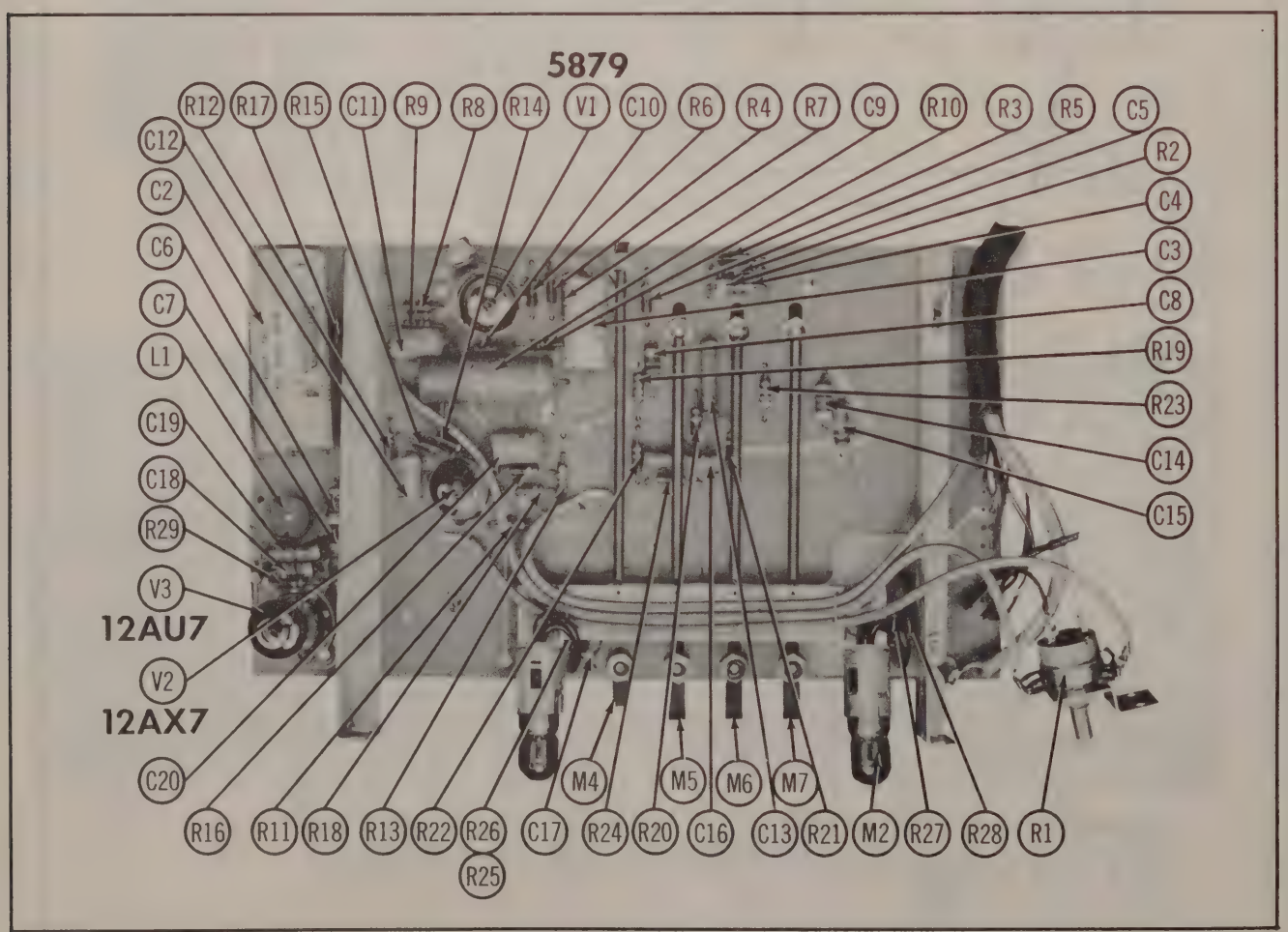
Pre-Amplifier Schematic — Model-304.



Top View - Model 304 Power Supply And Amplifier.



Model 304 Pre-Amplifier

Erase And Bias Current-

The following current should be available at 65KC, measured by determining the voltage drop across a 100 ohm non-inductive resistor in the ground lead of the head.

1. Erase Current-6 to 8MA

2. Bias Current-. 6 to . 7MA

Erase Defective-

1. Head not properly aligned or head defective .

2. Too much oxide deposits on head should be cleaned with soft cloth and alcohol.

Motor Runs But Mechanism Will Not Operate-

1. Fast Forward control (7) in "Pause" position . Turn control to "Normal".

2. Take-up belt (24), fast forward drive belt (85) broken or off pulleys. Replace.

Slow Speed-

1. Machine has been exposed to low temperature . Allow machine to warm up to room temperature.

LUBRICATION

All moving parts of this recorder are in either sealed ball bearings, or self-lubricating oilite bearings. Additional lubrication should not be required except in cases of extreme use or replacement of parts. When lubricating, wipe bearing areas with light wax free oil (instrument oil).

CAUTION: Any excess oil may seep to the outer edges of moving parts and cause slippage in the drive mechanism. Should this occur, wipe off all parts thus affected with a soft cloth and Carbon Tetrachloride.

CLEANING

The majority of defects, other than wear or breakage, can be traced to dirty surfaces. The recording head (16), capstan, and pressure roller (12) are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts . This accumulation should be periodically removed since it may cause faint recordings and poor playback. Wipe off the above surfaces carefully with a clean cloth . If dirt is caked or hard and will not come off with a dry cloth, dampen cloth slightly with Carbon Tetrachloride.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	1802	Forward-Reverse Knob	36	9040-69	Shoulder Nut
2	9040-438	Speed Change Knob	37	9040-222	Truarc (For 1/4" Shaft)
3	1789	Head Cover	38	9040-327	Brake Bar
4	1753	Main Cover	39	9040-71	Slide Bar Spring
5	1419	Main Cover Mounting Screw	40	9040-434	Rewind Idler Washer
6	1426	Cover Mtg. Screw	41		Rewind Idler Lever
7	3558	Fast Forward Control	42	9040-433	Rewind Idler Shoulder Nut
8	1755	Record Key	43		Lever (Part of Item 67)
9	1756	Radio Mic Key	44	9040-473	Rewind Idler Spring
10	1757	Bass Key	45	9040-429	Washer
11	1758	Treble Key	46	9040-431	Spacer
12	9040-271	Pressure Roller Assembly	47	9040-82	Fast Forward Brake Spring
13	9040-148	Hairpin Spring	48	9040-441	Spacer
14	9040-146	Fibre Washer	49	9040-492	Brake
15	9040-182	Pressure Release Lever Assy.	50	9040-385	Clutch Disc
16	2000	Record Head	51	9040-418	Felt Clutch
17	2001	Erase Head	52	9040-428	Idler Wheel
18	9040-161	Record Head Bracket	53	9040-390	Clutch Pulley Assembly
19	9040-161	Erase Head Bracket	54	9040-424	Impedance Arm Assembly
20	9040-2	Head Mounting Bracket	55	9040-487	Clutch Spring
21	9040-350	Pressure Roller Slide Plate	56	9040-452	Washer
21A		Arm Adjusting Plate	57	9040-121	"E" Ring
21B		Pressure Arm	58	9040-405	Motor Plate
22	9040-76	Pressure Arm Spring	59		Lower Mechanism Plate
23	9040-399	Tape Guide Assembly	60	9040-360	Ball Bearing - Reel Spindle
23A		Tape Guide Mounting Screw	61		Spacer
24	9040-270	Flat Belt	62	9040-338	Rewind Brake Assembly
25	9040-465	Right Spindle Assy.	63	9040-88	Rewind Brake Spring
26	9040-292	Take Up Idler Assy.	64	9040-389	Motor Assembly
27	9040-391	Take Up Idler Spring	65		Screw
28	9040-29	Take Up Idler Stop	66	9040-367	Fan
29	9040-90	Grommet	67	9040-456	Control Shaft Assembly
30	9040-64	Pressure Release Lever Button	68	9040-46	Cam Roller
31	9040-120	Cup Washer	69	9040-406	Flywheel
32	9040-464	Left Spindle Assembly	70	9040-467	Set Screw
33		Upper Mechanism Plate	71	9040-455	Set Screw Plug
34	9040-485	Azimuth Heads Spring	72	9040-303	Capstan Shaft
35	9040-3	Detent Slide	73	9040-304	Flywheel Pulley

MECHANICAL PARTS LIST (Cont.)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
74	9040-470	Capstan Drive Belt	82	9040-193	Fast Forward Pulley Assembly
75	9040-457	Change Arm Assembly	83	9040-251	Washer
76	9040-437	Speed Change Detent	84	9040-123	"E" Ring
77	9040-83	Detent Slide Spring	85	9040-48	Fast Forward Belt
78	9040-410	Capstan Bracket	86	9040-443	Fast Forward Pulley Spindle
79	9040-412	Fast Forward Cam Shaft Assy.	87	9040-467	Set Screw
80	9040-360	Ball Bearing - Reel Spindle	88	9040-495	Fast Forward Assembly
81	9040-214	Socket Head Screw	89	9040-189	Cam and Bushing Assembly

ELECTRICAL PARTS LIST PRE-AMP.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1	1002	5879, Pre-Amp.	R3	9	Resistor, 100K, 1/2 W.
V2	1004	12AX7, AF Amp.	R4	13	Resistor, 1Meg, 1/2 W.
V3	1000	12AU7, AF Amp., Bias Osc.	R5	4	Resistor, 10K, 1/2 W.
C1A	353	Elect. Cap., 40MFD @ 400V.	R6	51	Resistor, 1000Ω, 1/2 W.
C1B		Elect. Cap., 40MFD @ 400V.	R7	2	Resistor, 2700Ω, 1/2 W.
C1C		Elect. Cap., 20MFD @ 400V.	R8	31	Resistor, 2Meg, 1/2 W.
C1D		Elect. Cap., 25MFD @ 25V.	R9	49	Resistor, 330K, 1/2 W.
C2A	355	Elect. Cap., 20MFD @ 450V.	R10	6	Resistor, 18K, 1/2 W.
C2B		Elect. Cap., 20MFD @ 450V.	R11	2	Resistor, 2700Ω, 1/2 W.
C3	356	Elect. Cap., 50MFD @ 6V.	R12	50	Resistor, 220K, 1/2 W.
C4	232	Cap. Ceramic, 100MMF @ 500V.	R13	49	Resistor, 330K, 1/2 W.
C5	234	Cap. Ceramic, 250MMF @ 500V. (Some Models Use 240MMF).	R14	13	Resistor, 1Meg, 1/2 W.
			R15	11	Resistor, 1500Ω, 1/2 W.
C6	237	Cap. Ceramic, 56MMF @ 500V.	R16	9	Resistor, 100K, 1/2 W.
C7	239	Cap. Ceramic, 1300MMF @ 500V. (Some Models Use 1500MMF).	R17	18	Resistor, 22K, 1/2 W.
			R18	18	Resistor, 22K, 1/2 W.
C8	231	Cap. Ceramic, 500MMF @ 500V.	R19	38	Resistor, 33K, 1/2 W.
C9	218	Cap. Molded Paper, .25MFD @ 400V.	R20	9	Resistor, 100K, 1/2 W.
			R21	9	Resistor, 100K, 1/2 W.
C10	201	Cap. Ceramic Disc, 10000MMF @ 600V.	R22	9	Resistor, 100K, 1/2 W.
			R23	1	Resistor, 470K, 1/2 W.
C11	209	Cap. Paper, .05MFD @ 400V.	R24	9	Resistor, 100K, 1/2 W.
C12	207	Cap. Paper, .03MFD @ 400V.	R25	38	Resistor, 33K, 1/2 W.
C13	239	Cap. Ceramic, 5000MMF @ 500V.	R26	9	Resistor, 100K, 1/2 W.
C14	237	Cap. Ceramic, 56MMF @ 500V.	R27	12	Resistor, 47K, 1/2 W.
C15	226	Cap. Ceramic, 250MMF @ 500V. (Some Models Use 240MMF).	R28	6	Resistor, 18K, 1/2 W.
			R44	9	Resistor, 100K, 1/2 W.
C16	239	Cap. Ceramic, 5000MMF @ 500V.	L1	1254	Osc. Coil
C17	236	Cap. Ceramic, 600MMF @ 500V. (Some Models Use 680MMF).	M1	1008	Neon Lamp, NE48, Normal
			M2	1008	Neon Lamp, NE48, Over-Record
C18	232	Cap. Ceramic, 100MMF @ 500V.	M3		Switch On Volume Control
C19	238	Cap. Ceramic, 1300MMF @ 500V.	M4	5302	Record Play Switch Bar
C20	209	Cap. Paper, .05MFD @ 400V.	M5	5303	Radio Mic. Switch Bar
R1	653	Volume Control and Switch, 500K	M6	5304	Bass Switch Bar
R2	13	Resistor, 1Meg, 1/2 W.	M7	5305	Treble Switch Bar

ELECTRICAL PARTS LIST POWER SUPPLY AND AMPLIFIER.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V4	1000	12AU7, AF Amplifier	R30	32	Resistor, 3.3K, 1/2 W.
V5	1005	6V6GT, Audio Output	R31	45	Resistor, 120K, 1/2 W.
V6	1005	6V6GT, Audio Output	R32	45	Resistor, 120K, 1/2 W.
V7	1006	6X5GT, Rectifier	R33	45	Resistor, 120K, 1/2 W.
C21	214	Cap., Molded Paper, .05MFD @ 200V.	R34	18	Resistor, 22K, 1/2 W.
			R35	1	Resistor, 470K, 1/2 W.
C22	217	Cap., Molded Paper, .05MFD @ 400V.	R36	1	Resistor, 470K, 1/2 W.
			R37	47	Resistor, 270Ω, 2 W.
C23	217	Cap., Molded Paper, .05MFD @ 400V.	R38	9	Resistor, 100K, 1/2 W.
			R39	56	Resistor, 20Ω, 10 W.
C24	202	Cap., Molded Paper, .25MFD @ 400V.	R40	11	Resistor, 270K, 1/2 W.
			R41	9	Resistor, 100K, 1/2 W.
C25	230	Cap., Molded Paper, .03MFD @ 600V.	R42	46	Resistor, 3.9K, 2 W.
			R43	46	Resistor, 3.9K, 2 W.
C26	230	Cap., Molded Paper, .03MFD @ 600V.	T1	1151	Power Transformer
			T2	1154	Output Transformer
C27	216	Cap., Molded Paper, .1MFD	SP1	2351	Loudspeaker 6 x 9 Oval
R29	13	Resistor, 1Meg, 1/2 W.	M8	555	Fuse Holder

PHOTOFACT* Folder

*TRADE MARK

DUMONT CHASSIS RA-340, RA-341, RA-342, RA-343

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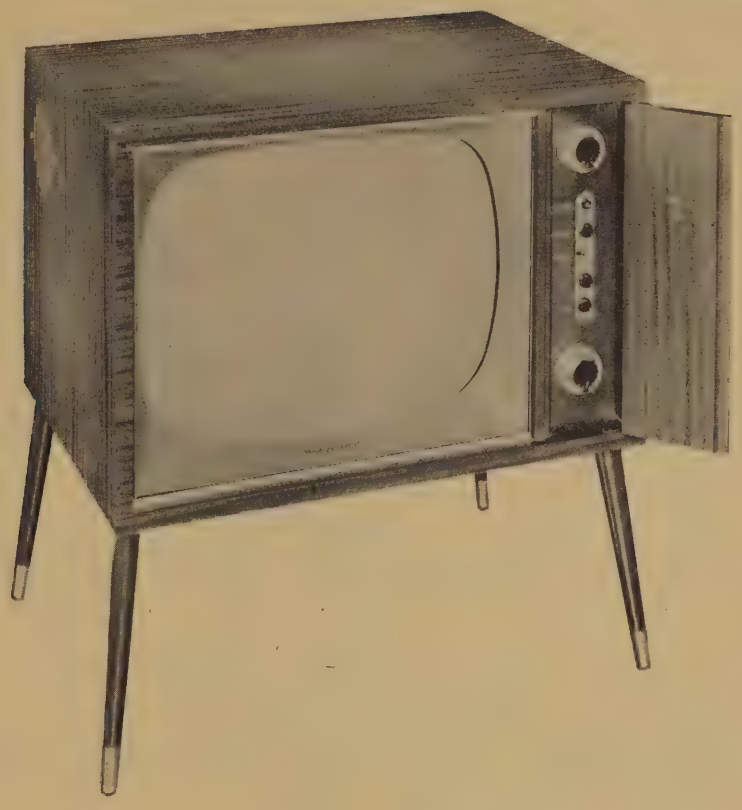
The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



DUMONT CHASSIS RA-340, RA-341, RA-342, RA-343

DUMONT CHASSIS RA-342

TRADE NAME	Dumont	MODELS	CHASSIS
		Conover, Croft, Templer	RA-340, RA-341
		Culver, Darien, D'Orsay, Douglas, Thorndyke	RA-342, RA-343
MANUFACTURER	Allen B. Dumont Laboratories, Inc., 257 Sixteenth Ave., Paterson, N.J.		
TYPE SET	Television Receiver		
TUBES	Twenty-three		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 2.09 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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DATE 5-56 SET 318 FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: DUMONT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	RF Amplifier	6BK7A	6BK7A	
V2	Mixer-Oscillator	6X8	6X8	
V3	1st. Video IF Amplifier	3CB6	3CB6	
V4	2nd. Video IF Amplifier	3CB6	3CB6	
V5	3rd. Video IF Amplifier	6CB6	6CB6	
V6	Video Amplifier-Noise Inverter	6U8	6U8	
V7	Video Output	6AQ5	6AQ5	
V8	AGC Keying	6AU6	6AU6	
V9	Sound IF Amplifier	6AU6	6AU6	
V10	Limiter	6AU6	6AU6	
V11	Ratio Detector-AF Amplifier-AGC Clamper	6T8	6T8	
V12	Audio Output	6AQ5	6AQ5	
V13	Bias Clamper-Sync Separator	6BK7A	6BK7A	
V14	Sync Phase Inverter-Horiz. AFC	12AU7	12AU7	
V15	Vert. Osc.-Horiz. AFC	12AU7	12AU7	
V16	Vert. Output	6AV5GT	6AV5GT	
V17	Horiz. Mult.	12AU7	12AU7	
V18	Horiz. Output	6CD6G	6CD6G	
V19	Damper	6AU4GT	6AU4GT	
V20	HV Rectifier	1B3GT	1B3GT	
V21	LV Rectifier	5U4G	5U4G	
V22	LV Rectifier	5U4G	5U4G	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: DUMONT PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V23	24DP4A ① 21ALP4A①	24DP4A ① 21ALP4A①	24DP4A ① 21ALP4A①	24DP4A ② 21ALP4A ②	① Aluminized ② Silver screen "85"
		21ALP4B ①	21ALP4A/B①	21ALP4A/B ②	
		21ALP4	21ALP4	21ALP4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: DUMONT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲80	400	03151429	RE1021	D066	FP368.3	TM-4046	Q-405	R2177 *
B	100	50			BR2045	FP142	TD-100-50	FM-4540	
C	■20	400							
D	▲10	400							
C2	5	100	03138362	PRS150V4	BR415	TC40	TD-4-150	MMT-1505	TVA-1402
C3A	40	25	03151428	RE1022	C152	FP378	TM-804020-450	T-180	R2176 *
B	▲10	400			BR4045	TC79	TD-50-25	FM-0250	
C	▲90	400							
D	■40	400							
C4	20	350	(Note 1)	PRS450V20	BR2035	TC65	TD-20-350	FM-4520	TVA-1608
C5	20	350	(Note 1)	PRS450V20	BR2035	TC65	TD-20-350	FM-4520	TVA-1608

Note 1. Not used in some versions.
* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DUMONT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	27				TCZ-27	TZ16	NP0L-270			
C7	4.7			NP0-SI4.7	TCZ-4R7	TZ07	NP0A-4R7	ZT-5547	5TCCB-V47	
C8	27				TCZ-27	TZ16	NP0L-270			
C9	1000									
C10	1000									
C11	1-4				829-4		3115-01-10	CT551		
C12	68			N750-DI68	TCN-68	N038	N750L-680		5TCU-Q68	
C13	91				TCZ-91	TZ29	NP0-337-910			
C14	47			N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C15	1-4				829-4		3115-01-10	CT551		
C16	1			NP0-SI1	TCZ-1	TZ03	NP0A-010		5TCCB-V1	
C17	27				TCZ-27	TZ16	NP0L-270			
C18	3-10				829-10					
C19	3.9									
C20	1000									
C21	1000									
C22	470			BPD-00047	DD-471	K060	831-471	UC-5347	5GA-T47	
C23	75			SI75	DD-750	G039	801-750	UC-5347	5GA-Q75	
C24	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C25	1000									
C26	1000									
C27	5.1		03138100	NP0-SI5		Z011	NP0A-050			
C28	20		03015790	NP0-SI20	TCZ-20	TZ13	NP0K-200	ZT-542	5TCC-Q2	
C29	1500		03153710	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C30	1.5		03133550	NP0-SI1.5	TCZ-1R5	TZ04	NP0A-1R5	ZT-5515	5TCCB-V15	
C31	30		03167450		TCZ-30	Z028	NP0L-300			
C32	1		03133510	NP0-SI1	TCZ-1	TZ03	NP0A-010		5TCCB-V1	
C33	27		03151520		TCZ-27	TZ16	NP0L-270			
C34	1500		03153710	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C35	.47	200	03140200	P288N-47		CUB2P47		PT4047	2TM-P47	
C36	.01	200	03140000	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C37	680		03166680	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C38	1000		03140200	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	680		03166680	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C40	1000		03153800	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C41	1500		03153710	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C42	680		03166680	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C43	470		03168040	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA DUMONT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C44	.000		05153700	BPD-001	DD-102	K069	801-001	DC-521	5HK-DI	
C45	4.7		03135090	NPO-DI4.7	TC2-4R7	Z010	NPOA-4R7	Z7-5647	5TCCB-V47	
C46	4.7		03153170	NPO-DI4.7	TC2-4R7	Z010	NPOA-4R7	Z7-5647	5TCCB-V47	
C47	130		03153690	NF80-EH130	TCN-130	N044	NF80L-130			
C48	.018	200	03140030							
C49	47		03151150	NPO-DI47	TC2-47	Z033	NPO-338-470	Z7-5647	5TCC-Q47	
C50	47		03151850	NPO-DI47	TC2-47	Z033	NPO-338-470	Z7-5647	5TCC-Q47	
C51	.047	600	03141800	BPD-05	DF-503	CUB6547		P7G147	6TM-S47	
C52	10000		03018990	BPD-01	DD-103	K082	81J-01	DC-511	5HK-EI	
C53	.033	600	03141790	BPD-03	DF-303	CUB6333		P7G133	6TM-S33	
C54	.1	600	03141830	P668N-1	DF-104	CUB6P1		P7601	6TM-P1	
C55	.033	600	03141780	BPD-02	DF-203	CUB6S23	81T-02	P7G123	6TM-S23	
C56	1000	3000	03133420	DYD-30-001	DD30-102	V3D1	3KV-102	DC3091	30GA-DI	
C57	.022	600	03141780	BPD-02	DD-203	CUB6S22	81T-02	P7G123	6TM-S22	
C58	.033	200	03140080							
C59	.15	200	03140370	P288N-15		CUB2P15		P7401S	2TM-P15	
C60	100		03153700	DD-102	DD-102	K069	801-001	DC-521	5HK-DI	
C61	2.2		03152490	NPO-S12.2	TC2-2R2	TZ05	NPOA-2R2		5TCCB-V22	
C62	47		03151500	NPO-DI47	TC2-47	Z033	NPO-338-470	Z7-5647	5TCC-Q47	
C63	5000		03153750	BPD-005	DD-502	K080	81J-005	DC-525	5HK-D5	
C64	10000		03015920	BPD-01	DD-103	K082	81J-01	DC-511	5HK-EI	
C65	1500		03153710	BPD-0015	DD-152	K071	80J-0015	DC-5315	5HK-DI5	
C66	15		03012050	NPO-EI15	TC2-15	TZ11	NPO5L-150		5TCC-Q15	
C67	5000		03153750	BPD-005	DD-502	K080	81J-005	DC-525	5HK-D5	
C68	680		03151690	EI680		TP5G	GP2K-681	UC-5368	5GA-T68	
C69	3300		03153830	DI-0033			GP2-333-332	UC-5233	5GA-D33	
C70	5000		03153750	BPD-005	DD-502	K080	81J-005	DC-525	5HK-D5	
C71	2200		03153820	DI-0022	D6-222	TP5T	GP2-332-222	UC-5232	5GA-D22	
C72	3300		03153830	DI-0033	D6-322	TP5T	GP2-333-472	UC-5323	5GA-D32	
C73	5000		03153750	BPD-006	DD-502	K080	81J-006	DC-525	5HK-D5	
C74	.047	300	03140340	BPD-05	DF-503	CUB2S47		P7147	2TM-S47	
C75	.0047	600	03141740	BPD-0047	D6-470	CUB6D47	GP2-333-472	P7E347	6TM-D47	
C76	3300		03153780	BPD-0032	D6-322	K073	GP2K-332	UC-5323	5HK-D32	
C77	330			SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C78	.0068	400	03141050	BPD-0068	D6-682	CUB5D68	81J-0068		5TM-D68	
C79	.1	200	03140380	P288N-1	DF-104	CUB2P1		P7401	2TM-P1	
C80	.047	400	03141100	BPD-05	DF-503	CUB4S47		P7147	4TM-S47	
C81	3300		03153830	DI-0033		TP43	GP2-333-332	UC-5233	5GA-D33	
C82	330		03151930	SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C83	.053	400		BPD-03	DF-303	CUB6333		P7E133	6TM-S33	
C84A	4700		e8000081	ePA221	ePC-106	K079	81J-0047	DC-5247	e8DC12	
B	4700					K079	81J-0047	DC-525		
C85	.01	300	03140300	BPD-01	D6-103	CUB4S1	81J-01	DC-511	4TM-SI	
C86	.0082	500	03140610							
C87	3300		03153820	DI-0033			GP2-333-332	UC-5233	5GA-D33	
C88	.1	600	03141540							
C89	.1	600	03141820	P668N-1	DF-104	CUB6P1		P7601	6TM-P1	
C90	1000	3000	03153190	DYD-30-001	DD30-102	V3D1	3KV-102	DC3091		
C91	1000		03153800	BPD-001	DD-102	K069	801-001	DC-521	5HK-DI	
C92	1000		03153800	BPD-001	DD-102	K069	801-001	DC-521	5HK-DI	
C93	.0033	600	03141030	BPD-03	DF-303	CUB6D33	GP2-333-332	P7E333	6TM-D33	
C94	033	200	03140330	P288N-033		CUB6S33		P7G133	6TM-S33	
C95	.01	200	03140300	BPD-01	D6-103	CUB4S1	GP2-333-103	P7411	4TM-SI	
C96	.0047	400	03139685	1464-0047		1R5D47		MCE405	4M-S47	
C97	22		03133020	DI-000022	D6-220	G024	831-220	UC-5422	5GA-Q22	
C98	470	500	03021830	1469-00047	D6-471	5RS747		MCE245	5M-347	
C99	.1	600	03141820	P668N-1	DF-104	CUB6P1		P7601	6TM-P1	
C100	390	500	03020500	1469-00039	D6-391	5RS739	81J-391	MCE243	M5-339	
C101	390	500	03020500	1469-00039	D6-391	5RS739	81J-391	MCE243	M5-339	
C102	.0047	600	03141740	BPD-0047	D6-472	CUB6D47	GP2-333-472	P7E347	6TM-D47	
C103	.01	400	03140280	BPD-01	DD-103	CUB4S1	81J-01	P7411	4TM-SI	
C104	75	4000			DD60-750					Note 2
C105	.047	400	03140700							
C106	.003	400	03140730							
C107	.47	400	03141840	P488N-47		CUB4P47		P7404	4TM-P47	Note 3
C108	.068	200	03140100	P288N-068		CUB4S68			4TM-S68	
C109	75	2000			DD30-750				20GA-Q75	

Note 2. Some versions use 68MMF in this application.
Note 3. Not used in some versions.
* Items C84A, C84B, R102A and R102B are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA DUMONT PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No.	MALLORY PART No	INSTALLATION NOTES
R1A	5000Ω	½	01058902	FI-20		*QJ-904	UE149S	Contrast (Panel)
B	1Meg	½		R2-S6				Volume tapped at 750KΩ & 400KΩ (Rear)
C	Switch			KB-1				Attach to R1B.
R2A	1Meg	½	01058034			B13-137	TA16A	Treble
B	Shaft		Not Req.			TM-3	Not Req.	Attach to R2A.
R3A	500KΩ	½	01058037	AB-80		A47-500K-Z	QJ1-133	TA35A	Bass
B	Shaft		Not Req.	AK-4		FK8-J	Not Req.	Not Req.	Attach to R3A.
R4A	100KΩ	½	01058331	AB-40		A47-100K-S	QJ1-128	U-61	Brightness
B	Shaft		Not Req.	AK-4		FK8-J	Not Req.	Not Req.	Attach to R4A.
R5A	25KΩ	½	01058336	FI-27				UF25SL)	Horiz. Hold (Panel)
B	1Meg	½		R2-S1				UR16L)	Vert. Hold (Rear)
R6A	3Meg	½	01058043	AB-94		A47-3Meg-S	QJ1-140	TA36L	Vert. Size
B	Shaft		Not Req.	AK-1		FK8-J	RQ	Not Req.	Attach to R6A.
R7A	1000Ω	½	01058022	AB-5		A47-1000-S	QJ1-108	TA13L	Vert. Linearity
B	Shaft		Not Req.	AK-1		FK8-J	RQ	Not Req.	Attach to R7A.
R8A	250KΩ	½	01058044	AB-50		A47-250K-S	QJ1-130	TA35AL	ABC Delay
B	Shaft		Not Req.	AK-1		FK8-J	RQ	Not Req.	Attach to R8A.
R9A	50KΩ	½	01058004	AB-31		A47-50K-S	QJ1-123	SU-35	Horiz. Drive
B	Shaft		Not Req.	AK-1		FK8-JA	RQ	Not Req.	Attach to R9A.

† Universal Replacement (Mallory Exact Duplicate Part No. UE822).
* Concentrikit Equivalent: K-6 Kit, Base Elements & Shafts; B17-114 & P17-103 [Panel] B16-137XX & R1-115 [Rear] 75-1 (Switch).

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA DUMONT PART No	IRC PART No.	NOTES
R10	10KΩ	½		BTS-10K	
R11	33KΩ	½		BTS-33K	
R12	820KΩ 5%	½		BTS-820K 5%	
R13	820KΩ 5%	½		BTS-820K 5%	
R14	68KΩ	½		BTS-680	
R15	4700Ω	½		BTS-4700	
R16	100KΩ	½		BTS-100K	
R17	22KΩ	½		BTS-22K	
R18	4700Ω	½		BTS-4700	
R19	120Ω	½		BTS-120	
R20	100KΩ	½		BTS-100K	
R21	100KΩ	½		BTS-100K	
R22	8200Ω	½		BTS-8200	
R23	3300Ω	2	02037640	BTB-3300	
R24	100KΩ	1	02032010	BTS-100K	
R25	390KΩ	1	02032080	BTS-390K	
R26	8200Ω	1	02032180		
R27	470Ω	1	02032400	BTS-470	
R28	47Ω	1	02031610	BTS-47	
R29	33KΩ	1	02031930		
R30	470Ω	1	02033400	BTS-470	
R31	18Ω	1	02031580	BTS-18	
R32	680Ω	1	02031870	BTS-680Ω	
R33	100KΩ 5%	1	02030980	BTS-100K 5%	
R34	100KΩ 5%	1	02030980	BTS-100K 5%	
R35	56KΩ	1	02031890	BTS-56K	
R36	47Ω	2	02032400	BTB-470	
R37	18KΩ	1	02031680	BTS-18K	
R38	3300Ω	1	02031830	BTS-3300	
R39	680Ω	1	02031870	BTS-680Ω	
R40	3900Ω	1	02031840	BTS-3900	
R41	4700Ω	1	02031860	BTS-4700	
R42	4700Ω	2	02034650	BTB-4700	
R43	3900Ω	1	02031840	BTS-3900	
R44	39Ω	1	02031650	BTS-39	
R45	470KΩ	1	02032090	BTS-470K	
R46	470KΩ	1	02032090	BTS-470K	
R47	10KΩ	1	02031890	BTS-10K	
R48	4500Ω	4	02033570		
R49	270Ω			BTS-270	Note 1
R50	510Ω 5%			BTS-510 5%	Note 1
R51	1.5Meg	1	02032150	BTS-1.5Meg	
R52	47KΩ	1	02031870	BTS-47K	
R53	68KΩ	1	02031890	BTS-68K	
R54	33KΩ	1	02031950	BTS-33K	
R55	33KΩ	1	02031950	BTS-33K	
R56	68KΩ	1	02034990	BTA-68K	
R57	47KΩ	1	02031970	BTS-47K	
R58	270KΩ	1	02032060	BTS-270K	Note 2
R59	10KΩ	1	02031890	BTS-10K	
R60	47KΩ	1	02034970	BTA-47K	
R61	120K	1		BTS-120K	Note 2
R62	4700Ω	1	02031850	BTS-4700	
R63	100KΩ	1	02032540	BTS-100K	
R64	560KΩ	1	02032110	BTS-560K	
R65	4.7Meg	1	02032210	BTS-4.7Meg	
R66	68KΩ	1	02031940	BTS-68K	
R67	2200Ω	1	02031810	BTS-2200	
R68	220Ω	1	02031690	BTS-220	
R69	100KΩ	1	02032010	BTS-100K	
R70	12KΩ	1	02034900	BTA-12KΩ	
R71	22KΩ	1	02031930	BTS-22K	
R72	390Ω	1	02031720	BTS-390	
R73	33KΩ	1	02031950	BTS-33K	
R74	15KΩ	1	02031910	BTS-15K	
R75	120KΩ	1	02032020	BTS-120K	
R76	120KΩ	1	02032020	BTS-120K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA DUMONT PART No	IRC PART No.	NOTES
R77	1Meg	½	02032150	BTS-1Meg	
R78	1Meg	½	02032150	BTS-1Meg	
R79	1Meg	½	02032600	BTS-1Meg	
R80	470KΩ	½	02032090	BTS-470K	
R81	1Meg	½	02032130	BTS-1Meg	
R82	470Ω	4	02233080	PW4-500	
R83	270Ω	1	03034700	BTA-270	
R84	33KΩ	1	02031950	BTS-33K	
R85	220KΩ	1	02032060	BTS-220K	
R86	470KΩ	1	02032090	BTS-470K	
R87	22KΩ 5%	½	02030800	BTS-22K 5%	
R88	240KΩ 5%	½	02030050	BTS-240K 5%	
R89	330KΩ	1	02032070	BTS-330K	
R90	390KΩ	1	02032080	BTS-390K	
R91	150KΩ	1	02032550	BTS-150K	
R92	22KΩ	1	02031930	BTS-22K	
R93	120KΩ	1	02032020	BTS-120K	
R94	2.7Meg	1	02032180	BTS-2.7Meg	
R95	47KΩ	1	02031970	BTS-47K	Note 3
R96	180KΩ 5%	½		BTS-180K 5%	Note 4
R97	33KΩ	1	02032130	BTS-1Meg	
R98	820Ω 5%	½	02030460	BTS-820 5%	
R99	330KΩ	1	02032630	BTA-330K	
R100	220KΩ	1	02031810	BTS-2200	
R101	1000Ω 5%	½		BTS-1000 5%	
R102A	82Ω	2	e 88000981	BTS-82	
B	10KΩ			BTS-10K	
R103	330KΩ	1	02032120	BTS-330K	
R104	100KΩ	1	02032540	BTS-100K	
R105	2.7Meg	1	02032180	BTS-2.7Meg	
R106	3400Ω 5%	1	02030570	BTS-3400 5%	
R107	2.2Meg	1	02032620	BTS-2.2Meg	
R108	39KΩ	3	03037960	BTB-39K	
R109	39KΩ	3	02037960	BTB-39K	
R110	2200Ω	1	02031810	BTS-2200	
R111	56KΩ	1	02034940	BTA-56K	
R112	82KΩ	1	02035000	BTA-82K	
R113	220Ω	1	02034690	BTA-220	
R114	270Ω	2	02037730	BTB-470	
R115	56Ω	1			
R116	680Ω	1			
R117	100KΩ	1	02032010		
R118	100KΩ	1	02032010		
R119	180KΩ	1	02032110		
R120	4.7Meg	1	02032210	BTS-4.7Meg	
R121	12KΩ 5%	½	02033740		
R122	27KΩ	1	02031940		
R123	2700Ω 5%	½	02030580		
R124	120KΩ 5%	½	02030970		
R125	100KΩ 5%	½	02030980		
R126	10KΩ 5%	½	02030720		
R127	68Ω	1			
R128	560KΩ	1	02032100	BTS-560K	
R129	1MΩ	1	02032040	BTS-1MΩK	
R130	15KΩ	1	02031910		
R131	1200Ω	1	02034780		
R132	1300Ω	1			
R133	7200Ω	10		PW10-7500	Note 5
R134	4700Ω	2	02034650	BTB-4700	
R135	10KΩ	2	02037890	BTB-10K	
R136	1000Ω	1			
R137	18KΩ	1	02034930		
R138	10KΩ	1	02032480		
R139	2000Ω	10	02113000	PW10-2000	
R140	40Ω	4	02233110	PW4-400	
R141	100KΩ	1	03045010	BTA-100K	

Note 1. In some versions, R49 and R50 are replaced with a single 180Ω ½W resistor.
Note 2. Not used in some versions.
Note 3. Some versions use a 33KΩ ½W resistor in this application.
Note 4. Some versions use a 100KΩ ½W resistor in this application.
Note 5. In some versions, R132, R133 are replaced with a single 8500Ω 10W resistor.
* Items R102A, R102B, C84A, C84B are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA DUMONT PART No.	Halloran PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	525VCT @ 2.09A	5V @ 3A	6.3V @ 4A	20009019 ① 20009017 ②			P8330 ③		R-18BC ③

① Used in some versions.
② Parallel and phase 6.3V @ 5A and 6.3V @ 1.2A windings.
③ Parallel 6.3V @ 6A windings tape 6.3V @ 1.2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA DUMONT PART No.	Halloran PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	20009781	B8704	A-3003	20971 ①	V405	A-8185	26A03	A-97X
T3	Horiz. Output Trans.	20009781	FB419 & RF800 *	HVO-36 *	25971 & 21481 *	X094 *	A-8353 * ②	FLY16 & WC-35 * ②	D-50 & WC-11 *
T4	Vert. Output Trans.	20009713	Z1900 ③	A-3038 ①		V310 ③	A-8143 ① ③	26S53 ① ③	A-97X ③
T5A	Yoke(90°) Horiz.(59MH) Vert. (42MH)	2101368	DF607 ①	MDF-92 ③	25SD1 ③	T90F19/43 ③	DY-18A ③	Y-15 ③	Y-41-1 ③
B		89013901 ② 2900077† ③							
T6	Horiz. Size Coil	21011015	RF800 ③	MWC-6	21RI ①	20LR15 ①	WC-8 ①	WC-32 ①	WC-12 ①

① Drill new mounting hole(s).
② Use 1:1.4 to 1 turns ratio.
③ Connect as auto transformer.
④ Alternate deflection yoke.
⑤ Use original rear cover and centering device.
⑥ Use terminals 3 and 4.
⑦ Centering device and yoke cover.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
9	9	9	9	9	8	9	9
7	7	7	7	7	1	7	7
4	4	4	4	3	3	4	4
3	3	3	3	1	4	1	3
6	6	Term "D" of 21481	Term "D" of 21481	6	6	7	Term 1 of WC-20
7	2	2	Term "E" of 21481	6	6	Term 2 of WC-20	Term 2 of WC-11
Connect With Coil Arms			Terms 'A' & 'B' of 21481 across 3 & 1			Terms 3 & 4 of WC-20 across 3 & 1	Red & Blue Terms of WC-11 across 3 & 1
Special Notes	8					8	8

8 If picture is out of phase, reverse either the primary or secondary windings of width coil.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	DUMONT PART No	REPLACEMENT DATA Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T7	5.3KΩ	3.2Ω Tap @ 1.6Ω	20009791						

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP	REPLACEMENT DATA DUMONT PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SPI	6"	PM	3-4Ω	18003704 ①	6A1	22S81	① Used in Chassis RA342, RA343.
	6"	PM		18003703 ②	6A1	22S61	② Used in Chassis RA340, RA341.
	8"	PM		18003733 ②	8A2I	20S82	③ Used in Chassis RA340, RA341, RA342, RA343
	10"	PM		18003672 ③	10A3I	23S81	RA343.
	10"	PM		18003851 ④	10A3I	23S61	④ Bi-rec. speaker - Chassis RA342, RA343
		PM		18003782 ④			

COILS (RF-IF)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA DUMONT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No	NOTES
L1	Ant. Matching Trans.	.6Ω	6Ω				
L2	Ant. Matching Trans.	.6Ω	.6Ω				
L3	UHF Trap	0Ω					
L4	Ant. Coils	0Ω					
L5	UHF IF Coil	0Ω					Tapped
L6	Ant. Shunt Coils	0Ω					High Channels
L7	Ant. Shunt Coils	0Ω					Low Channels
L8	Fil. Choke	0Ω					
L9	Neut. Coil	0Ω					
L10	Parasitic Suppressor	0Ω					1 Turn Wire On 10Ω Resistor, Channel 13
L11	RF Coil	0Ω					
L12	RF Coils	0Ω					
L13	UHF IF Coil	0Ω					
L14	RF Coil	0Ω					
L15	Mixer Grid Coil	0Ω					Channel 13
L16	Mixer Grid Coils	0Ω					
L17	UHF IF Coil	0Ω					
L18	Osc. Coil	0Ω					Channel 13
L19	Osc. Coils	0Ω					
L20	Conv. Plate	1Ω	.2Ω				
L21	41.25MC Trap	0Ω		21013021		6236	
L22A	59.75MC Trap	1Ω		21013761			
	R47.25MC Trap	1Ω					
L23	1st Video IF	1Ω	.1Ω	20010071			
L24	Fil. Choke	0Ω		21011762	19-1001		4604
L25	2nd Video IF	1Ω	.1Ω	20009991	17-4522	TV-130	6319
L26	Fil. Choke	0Ω		21011762	19-1001		4604
L27	3rd Video IF	1Ω	.1Ω	20009990	17-4524	TV-130	6319
L28	4th Video IF	1Ω	.1Ω	20009993	17-4524	TV-130	6319
L29	Series Peaking Coil	4.5Ω		21013451		4626	27 Microhenries
L30	Shunt Peaking Coil	9.2Ω		21006628	19-4201	TV-184	6154	197 Microhenries
L31	Series Peaking Coil	5.3Ω		21006623	19-3100	TV-181	6177	100 Microhenries
L32	4.5MC Trap	1.9Ω		21013782	20-1004	TV-151	1469	
L33	Shunt Peaking Coil	15Ω		21006627	19-4400		6134	370 Microhenries
L34	Series Peaking Coil	6.2		21006622	19-3100	TV-181	6177	100 Microhenries
L35	Series Peaking Coil	10.5Ω		21013954	19-3250	TV-185	6181	230 Microhenries
L36	Shunt Peaking Coil	6.5Ω		21006628	19-4201	TV-184	6154	197 Microhenries
L37	Series Peaking Coil	4.5Ω		21012451			4626	27 Microhenries
L38	1st Sound IF	1.8Ω		21013792	20-1004	TV-151	1469	
L39	2nd Sound IF	8Ω		21013912				
L40	Ratio Det.	4.7Ω	.7Ω CT	20009043	17-3497*	TV-115*	6206*	Tertiary Winding - .6Ω
L41	RF Choke	6.1Ω		21006550	19-1005		4612	8.2 Microhenries, IRC Part #CL-1.
L42	RF Choke	6.1Ω		21006550	19-1005		4612	8.2 Microhenries; IRC Part #CL-1
L43	RF Choke	5Ω		21013102				2700 Microhenries

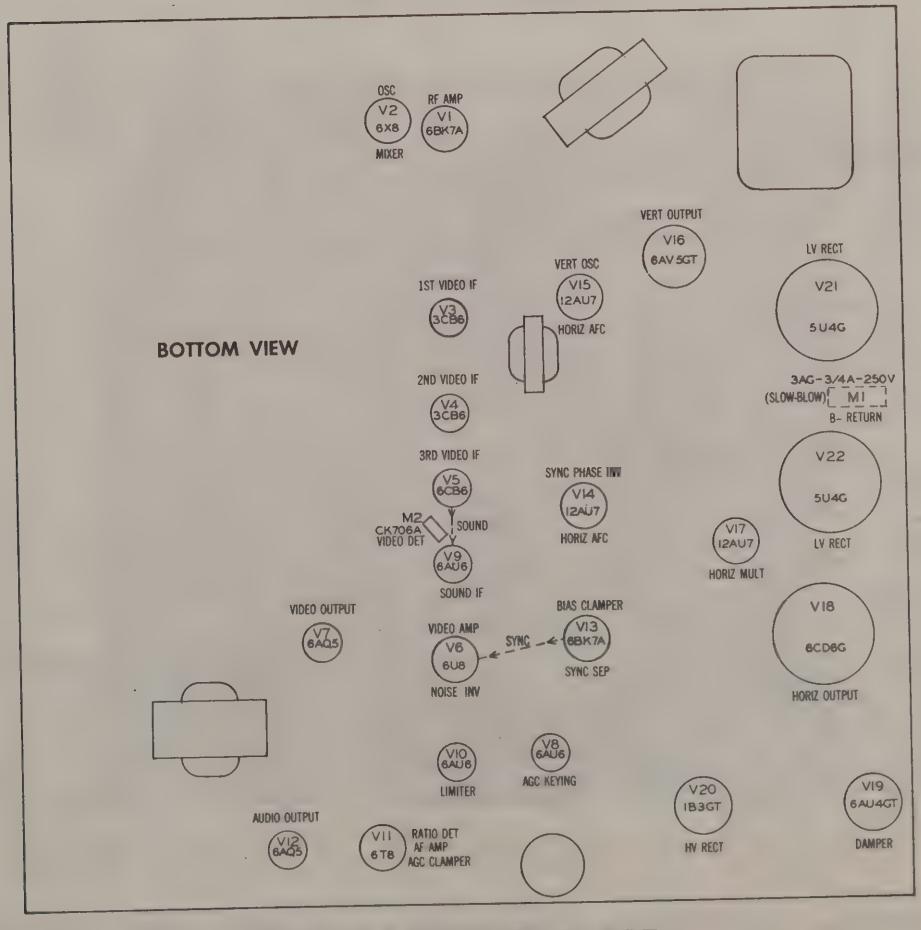
* Use Adaptor Plate.

DUMONT CHASSIS RA-340, RA-341, RA-342, RA-343

RESISTANCE MEASUREMENTS

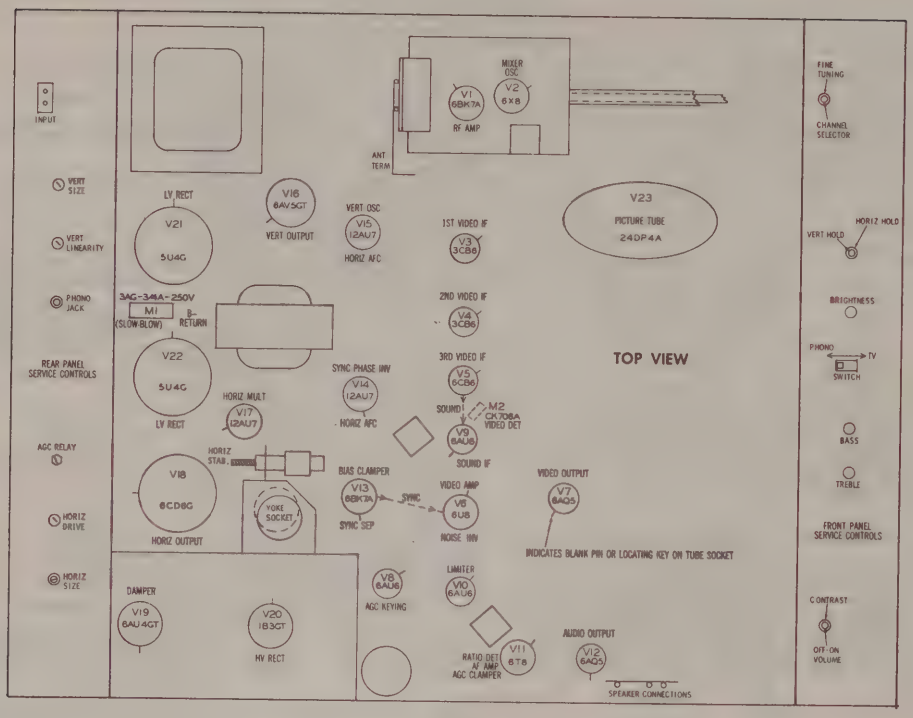
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7A	INF	1Meg	0Ω	0Ω	.1Ω	† 3.9KΩ	350KΩ	INF	0Ω
V 2	6X8	0Ω	22KΩ	† 7KΩ	.1Ω	0Ω	0Ω	100KΩ	† 110KΩ	† 12KΩ
V 3	3CB6	100KΩ	47Ω	.5Ω	0Ω	▲ 420Ω	▲ 470Ω	0Ω		
V 4	3CB6	50KΩ	▲ 18Ω	.5Ω	.1Ω	† 500Ω	† 500Ω	60KΩ		
V 5	6CB6	.1Ω	180Ω	.1Ω	0Ω	† 3KΩ	† 3KΩ	0Ω		
V 6	6U8	180KΩ	3.3KΩ	† 6.5KΩ	0Ω	.1Ω	† 10KΩ	39Ω	600KΩ	† 32KΩ
V 7	6AQ5	1Meg	500Ω	0Ω	.1Ω	† 4.5KΩ	† 42Ω	1Meg		
V 8	6AU6	† 50KΩ	† 7KΩ	0Ω	.1Ω	500KΩ	† 42Ω	† 7KΩ		
V 9	6AU6	1.8Ω	0Ω	0Ω	.1Ω	† 4.6KΩ	† 4.6KΩ	220Ω		
V 10	6AU6	100KΩ	0Ω	0Ω	.1Ω	† 10KΩ	† 10KΩ	0Ω		
V 11	6T8	INF	33KΩ	INF	.1Ω	0Ω	1Meg	0Ω	2Meg	† 500KΩ
V 12	6AQ5	470KΩ	270Ω	.1Ω	0Ω	† 900Ω	† 500Ω	470KΩ		
V 13	6BK7A	† 220KΩ	†45KΩ	470KΩ	0Ω	.1Ω	† 40KΩ	2.7Meg	0Ω	NC
V 14	12AU7	4.8Meg	4.8Meg	18KΩ	0Ω	0Ω	† 9KΩ	1Meg	820Ω	.1Ω
V 15	12AU7	18KΩ	18KΩ	4.8Meg	.1Ω	.1Ω	● 3Meg	1Meg	160Ω	0Ω
V 16	6AV5GT	2.2Meg	0Ω	600Ω	NC	† 1KΩ	NC	.1Ω	† 40KΩ	
V 17	12AU7	● 140KΩ	130KΩ	2.7KΩ	.1Ω	.1Ω	● 50KΩ	5Meg	2.7KΩ	0Ω
V 18	6CD6G	TP	.1Ω	0Ω	TP	750KΩ	TP	0Ω	† 8.5KΩ	TOP CAP ● 18Ω
V 19	6AU4GT	NC	NC	130KΩ	NC	† 53Ω	NC	.1Ω	0Ω	
V 20	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ● 410Ω
V 21	5U4G	NC	13KΩ	NC	20Ω	NC	20Ω	NC	13KΩ	
V 22	5U4G	NC	13KΩ	NC	22Ω	NC	22Ω	NC	13KΩ	
V 23	24DP4A	0Ω	1.5Meg	PIN 6 0Ω	PIN 10 ● 80KΩ	PIN 11 † 30KΩ	PIN 12 .1Ω			

† MEASURED FROM PIN 2 OF V21.
▲ MEASURED FROM PIN 7 OF V4.
● MEASURED FROM PIN 3 OF V19.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

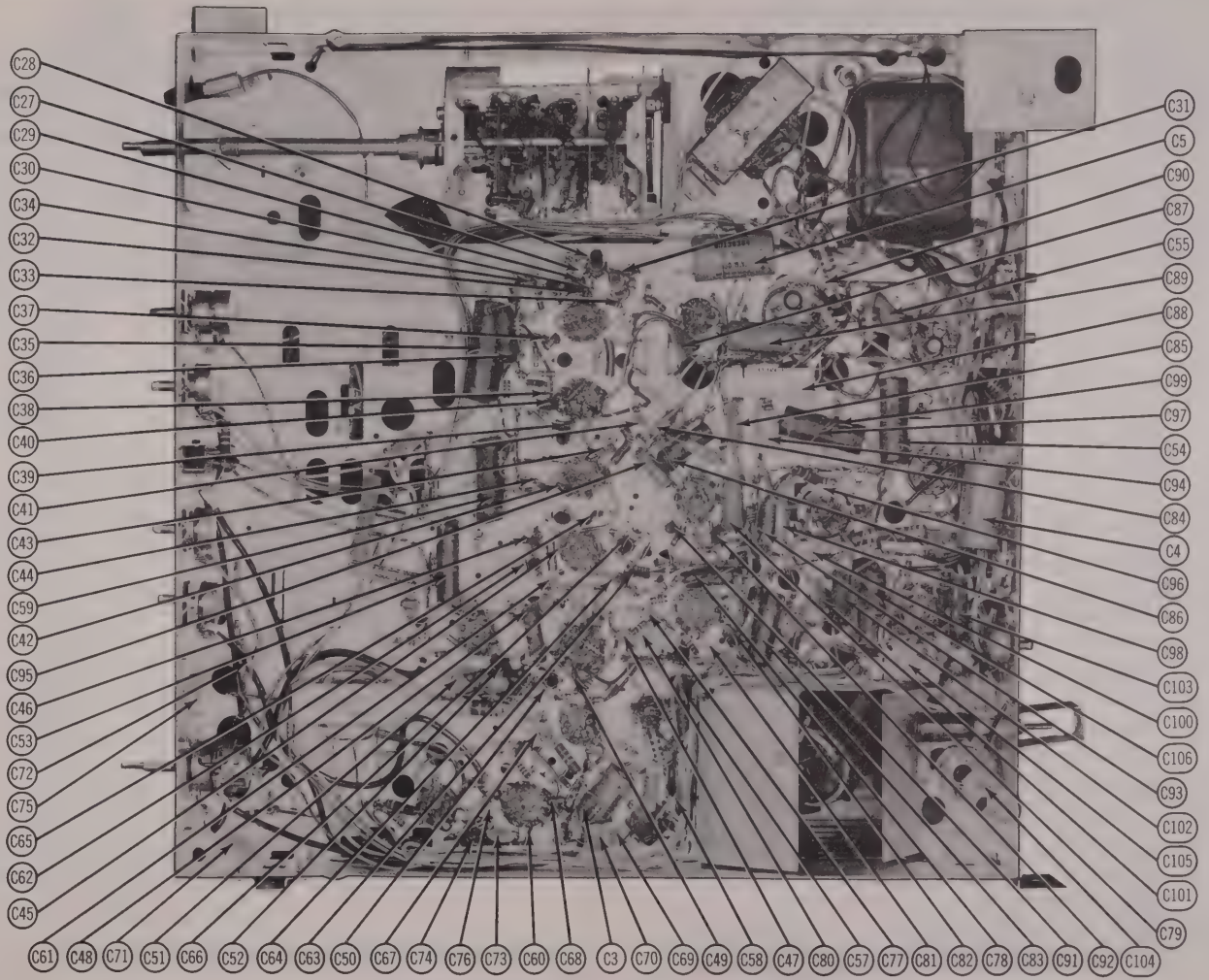
POWER SUPPLY FAILURE
No raster, no sound - V21, V22, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V8, V23
Has pic, no sound - V9, V10, V11, V12
Overloaded picture - V8, V11

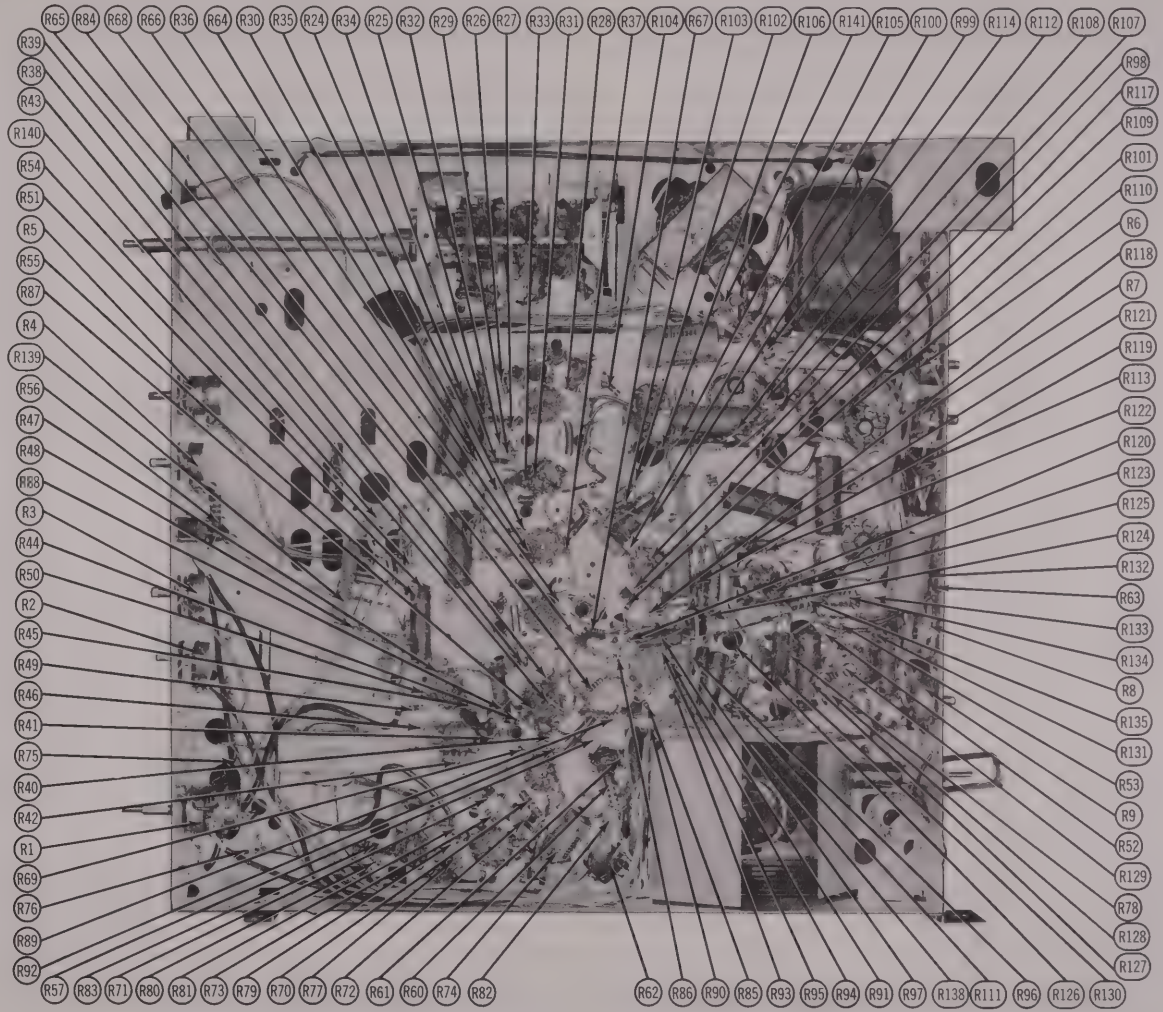
SYNC FAILURE
No vert. sync - V14, V15
No horiz. sync - V14, V17
No vert. or horiz. sync - V13, V14

SWEEP FAILURE
No raster, has sound - V17, V18, V19, V20, V23
No vertical deflection - V14, V15
Poor vert. linearity or foldover - V14, V15
Poor horiz. linearity or foldover - V17, V18, V19
Narrow picture - V17, V18, V19, V20, V21, V22
Vert. off freq. - V14, V15
Horiz. off freq. - V14, V17

NOTE: V3 and V4 are connected in series. An open filament in either one of these tubes may cause the set to be inoperative.



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.

2. Remove 4 wood screws. Remove rear cover.

3. Disconnect speaker leads, picture tube socket, yoke plug, antenna plugs, HV lead and ground strap.

4. Remove 1 hex nut holding front chassis brace and 2 chassis bolts. Slide chassis out to remove.

5. Remove 2 speaker nuts. Remove speaker.

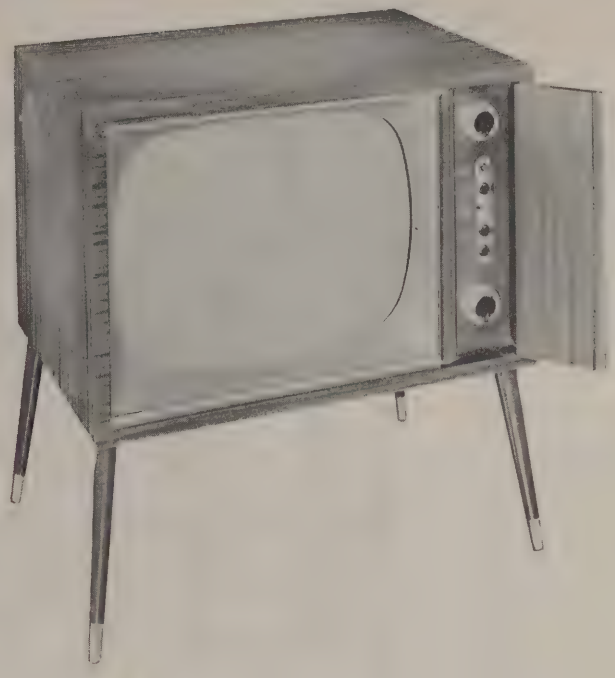
PICTURE TUBE REMOVAL

1. Remove chassis as outlined above.

2. Remove 4 hex nuts holding picture tube assembly to cabinet. Remove assembly.

3. Lay picture tube face on a soft surface and remove ion trap.

4. Remove 1 metal screw holding strap to yoke and lift strap and yoke assembly from picture tube.



CHASSIS

RA-340, RA-341,
RA-342, RA-343

DUMONT CHASSIS RA-340,
RA-341, RA-342, RA-343

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENT S

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 4 wood screws holding metal strip at the top edge of the safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chasis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the receiver without removing the rear cover. Adjust the horizontal stabilizer slug (L44) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L40) located on top of chassis for maximum sound and minimum buzz.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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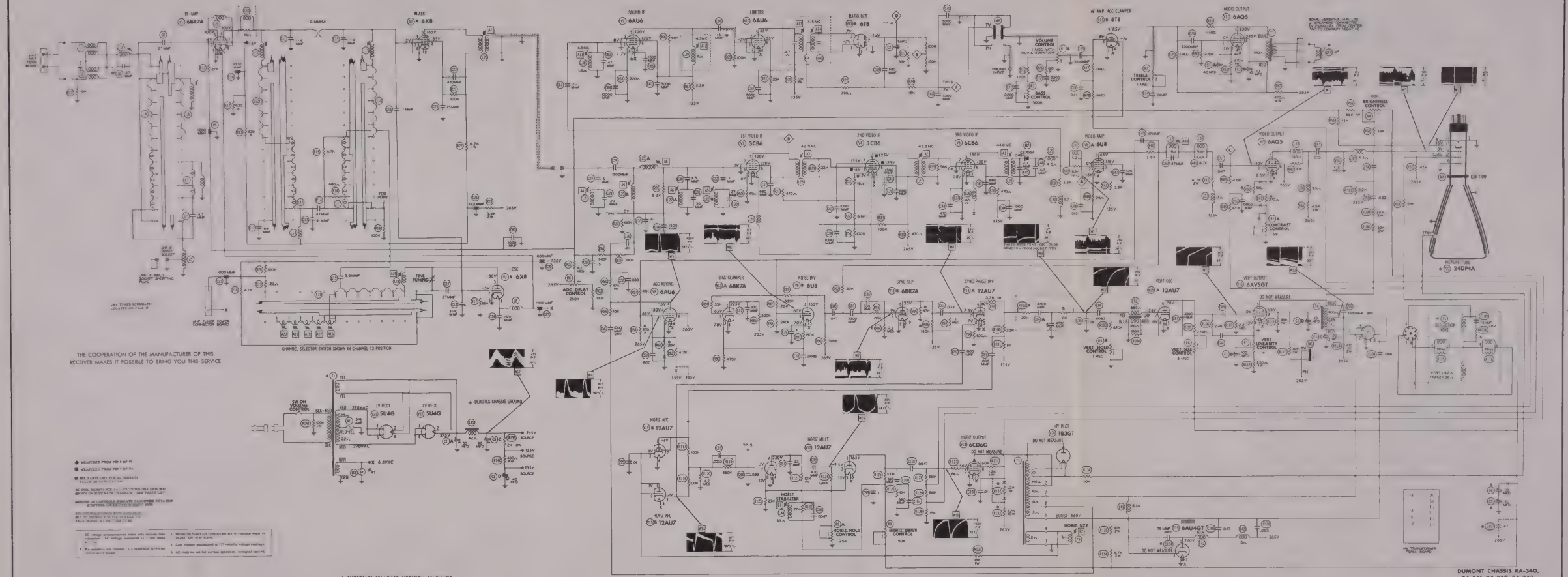
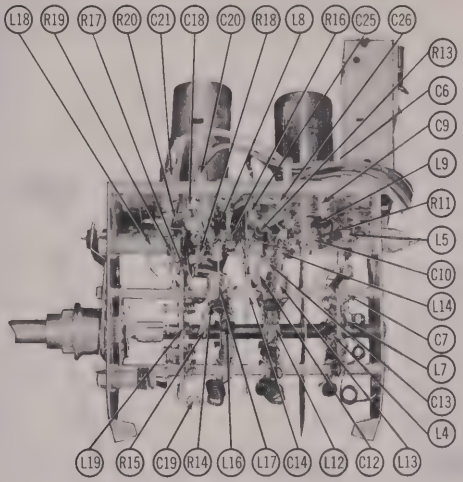
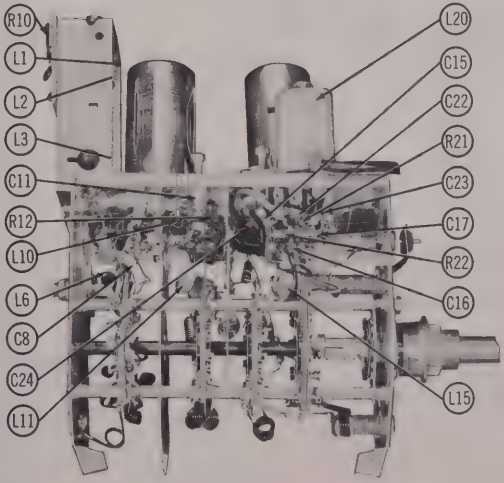


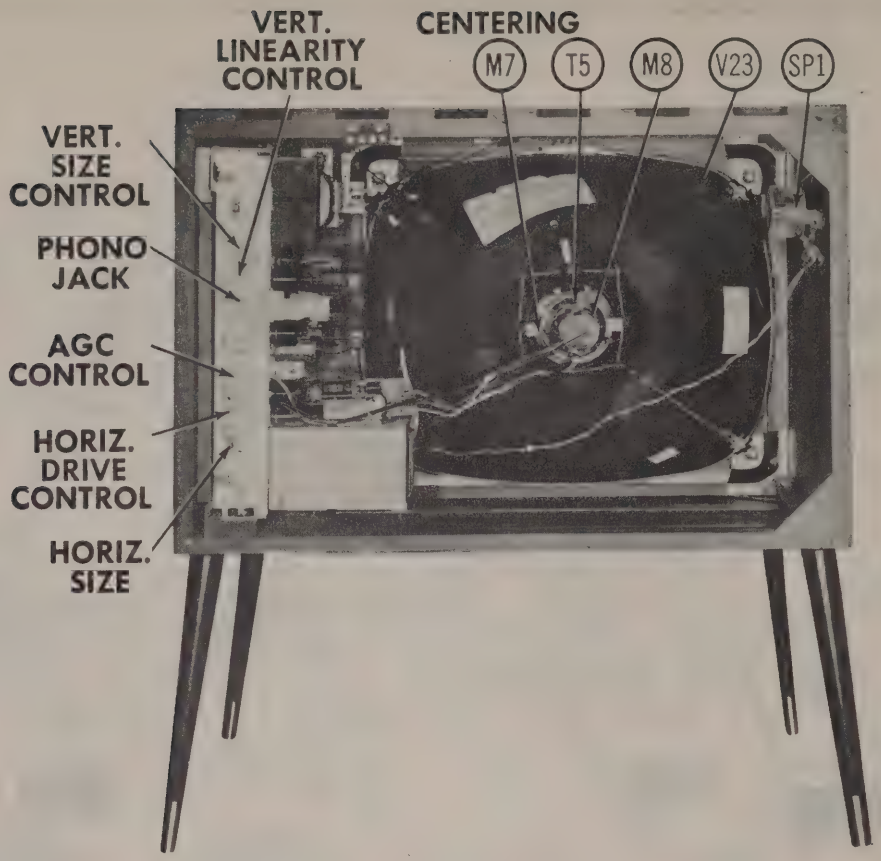
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE



RF TUNER-RIGHT SIDE



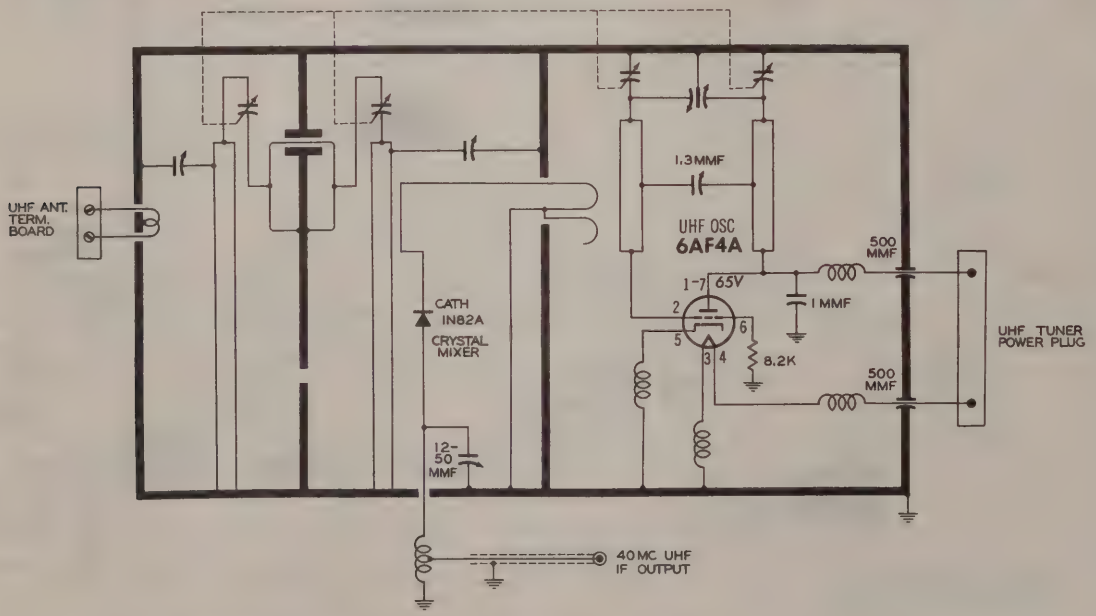
RF TUNER-LEFT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.
2. Set the horizontal hold control to its mid-range position.
3. Adjust the horizontal stabilizer slug (B1) to the center of its effective synchronizing range, then momentarily remove signal by switching off channel and back again. The picture should pull into sync.
4. Adjust the horizontal size slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.



UHF TUNER PART NO. 89013771 USED WITH CHASSIS RA 341, AND 343

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER SCHEMATIC

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA DUMONT PART No.	ASHCROFT PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C44	1000		33153700	BPD-001	DD-102	K069	801-001	DC-531	5HK-DI	
C45	4.7		33153690	NPO-DI4 ⑦	TC2-4R7	Z010	NP0A-4R7	ZT-5547	5TCCB-V47	
C46	4.7		33153570	NPO-DI4 ⑦	TC2-4R7	Z010	NP0A-4R7	ZT-5547	5TCCB-V47	
C47	120		33153620	N750-SI120	TCN-120	N044	N750L-120			
C48	.018	200	33140030							
C49	47		33153550	NPO-DI47	TC2-47	Z033	NP0-330-470	ZT-5447	5TCC-Q47	
C50	47		33153550	NPO-DI47	TCE-47	Z033	NP0-330-470	ZT-5447	5TCC-Q47	
C51	.047	600	33153700	DP-503	CUBS647			PT5647	6TM-S47	
C52	10000		33153830	BPD-01	DD-103	K083	81J-01	DC-5I	5HK-EI	
C53	.033	600	33141780	BPD-03	DP-303	CUBS833		PT5133	6TM-S33	
C54	.1	600	33141830	P68AN-1	DP-104	CUBS1P1		PT501	6TM-P1	
C55	.022	600	33141780	BPD-03	DD-303	CUBS833	81T-03	PT5123	6TM-S23	
C56	1000	3000	33153830	NYD-30-001	DD30-102	V1D1	3KV-102	DC3021	30GA-D1	
C57	.022	600	33141780	BPD-03	DD-303	CUBS833	81T-03	PT5123	6TM-S23	
C58	.033	200	33140060							
C59	.01	500	33140090	P38DN-15		CUBS1P15		PT5015	5TM-P15	
C60	1000		33153700	DD-102	DD-102	K069	801-001	DC-531	5HK-DI	
C61	2.2		33153690	NPO-SI2.2	TCE-2R2	T506	NP0A-2R2		5TCCB-V22	
C62	47		33153550	NPO-DI47	TCE-47	Z033	NP0-330-470	ZT-5447	5TCC-Q47	
C63	5000		33153750	BPD-005	DD-502	K080	81J-005	DC-535	5HK-D5	
C64	10000		33153830	BPD-01	DD-103	K083	81J-01	DC-5I	5HK-EI	
C65	.1500		33153710	BPD-0015	DD-152	K071	801-0015	DC-5315	5HK-D15	
C66	15		33102150	NPO-SI15	TC2-15	T2II	NP0K-150		5TCC-Q15	
C67	5000		33153750	BPD-005	DD-502	K080	81J-005	DC-535	5HK-D5	
C68	680		33151960	SI680	D6-681	TP90	GP2K-681	UC-5366	5GA-T68	
C69	3300		33153830	DI-0033			GP2-333-332	UC-5333	5GA-D33	
C70	5000		33153750	BPD-005	DD-502	K080	81J-005	DC-535	5HK-D5	
C71	2200		33153820	DI-0022	D6-222	TP57	GP2-333-223	UC-5323	5GA-D23	
C72	2200		33153820	DI-0022	D6-222	TP57	GP2-333-472	UC-5323	5GA-D23	
C73	5000		33153750	BPD-005	DD-502	K080	81J-005	DC-525	5HK-D5	
C74	.047	300	33140340	BPD-05	DP-503	CUBS247		PT5147	5TM-S47	
C75	.0047	600	33141740	BPD-0047	DP-472	CUBD47	GP2-333-472	PT5247	6TM-D47	
C76	2300		33153720	BPD-0023	D6-232	K073	81J-0023	DC-5233	5HK-D23	
C77	330			22339	D6-331	TP43	GP2K-331	DC-5333	5GA-T33	
C78	.0068	400	33141050	BPD-0068	D6-682	CUBD68	81J-0068		6TM-D68	
C79	.1	200	33140390	P38DN-1	DP-104	CUBS1P1		PT501	5TM-P1	
C80	.047	400	33141200	BPD-05	DP-503	CUBS247		PT5147	4TM-S47	
C81	3300		33153830	DI-0033			GP2-333-332	UC-5333	5GA-D33	
C82	3300		33153830	DI-331	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C83	.033	400		BPD-03	DP-303	CUBS833		PT5133	5TM-S33	
C84A	4700		48000096I	4PA231		E079	81J-0047	DC-535	40UC2	
B	4700				4PC-106	E079	81J-0047	DC-535		
C85	.01	200	33140300	BPD-01	D6-103	CUBS81	81J-01	DC-511	4TM-SI	
C86	.0043	600	33140610							
C87	3300		33153830		D6-0033		GP2-333-332	UC-5333	5GA-D33	
C88	.1	600	33141540							
C89	.1	600	33141830	P68BN-1	DP-104	CUBS1P1		PT501	6TM-P1	
C90	1000	3000	33152190	NYD-30-001	DD30-102	V3D1	3KV-105	DC3021		
C91	1000		33153700	BPD-001	DD-102	K069	801-001	DC-531	5HK-DI	
C92	1000		33153800	BPD-001	DD-102	K069	801-001	DC-521	5HK-DI	
C93	.0033	500	33141030	DI-0033	D6-332	CUBD33	GP2-333-332	PT5233	6TM-D33	
C94	.033	300	33140330	P38DN-353		CUBS833		PT5133	5TM-S33	
C95	.01	300	33140300	BPD-01	D6-103	CUBS81	GP2-333-103	PT501	4TM-SI	
C96	.0047	600	33140610	1664-0047				MCE645	6M-S47	
C97	33		33133030	DI-000033	D6-330	G094	831-330	UC-5423	50A-Q33	
C98	470	500	33121130	J469-00047	DE-471	SR5T47	81J-471	MCE245	M5-347	
C99	.1	600	33141830	P68BN-1	DP-104	CUBS1P1		PT501	6TM-P1	
C100	390	500	33130500	J469-00039	DE-391	SR5T39	81J-39I	MCE545	M5-339	
C101	390	500	33130500	J469-00039	DE-391	SR5T39	81J-391	MCE545	M5-339	
C102	.0047	600	33140740	BPD-0047	DP-472	CUBD47	GP2-333-472	PT5247	6TM-D47	
C103	.01	400	33140300	BPD-01	DE-103	CUBS81	81J-01	PT501	4TM-SI	
C104	75	4000			D30-750					Note 3
C105	.047	400	33140700							
C106	.082	400	33140730							
C107	.47	400	33141050	P68BN-47		CUBS4P47		PT5047	4TM-P47	Note 3
C108	.068	300	33140500	P38BN-068		CUBS4S68			4TM-S68	
C109	.75	3000			D30-750				30GA-G75	

Note 2. Some versions use 68MMF in this application.
Note 3. Not used in some versions.
• Items C84A, C84B, R103A and R103B are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA DUMONT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	31056503	F1-30		*QJ-504	UH149IS	Contrast (Panel)
B	1MEG	½		S2-06				Volume tapped at 750KΩ & 400KΩ (Rear)
C	Switch			KB-1				Attach to R1B.
R2A	1MEG	½	31056034			B13-157	TA15A	Treble
B	Shaft		Not Req.			TM-3	Not Req.	Attach to R2A.
R3A	500KΩ	½	31056037	AB-60		A47-500K-Z	Q13-153	TA15A Bass
B	Shaft		Not Req.	AK-4		FK3-4	Not Req.	Not Req. Attach to R3A.
R4A	100KΩ	½	31026281	AB-60		A47-100K-S	Q11-132	Brightness
B	Shaft		Not Req.	AK-4		FK3-4	Not Req.	Not Req. Attach to R4A.
R5A	2.5KΩ		31058336	F1-27				UF253L; Horiz. Hold (Panel)
B	1MEG			S2-01				UR1EL ⑦ Vert. Hold (Rear)
R6A	2MEG		31056043	AB-64		A47-2Meg-S	Q11-160	TA3EL Vert. Size
B	Shaft		Not Req.	AK-1		FK3-1	BQ	Not Req. Attach to R6A.
R7A	100KΩ		31056023	AB-5		A47-100K-S	Q11-103	TA1EL Vert. Linearity
B	Shaft		Not Req.	AK-1		FK3-1	BQ	Not Req. Attach to R7A.
R8A	250KΩ		31056044	AB-52		A47-250K-S	Q11-130	TA35L ABC Delay
B	Shaft		Not Req.	AK-1		FK3-1	BQ	Not Req. Attach to R8A.
R9A	50KΩ		31056024	AB-31		A47-50K-S	Q11-123	TA1SL Horiz. Drive
B	Shaft		Not Req.	AK-1		FK3-1	BQ	Not Req. Attach to R9A.

† Universal Replacement (Mallory Exact Duplicate Part No. UR32).
• Concentrikit Equivalent: K-6 Kit, Base Elements & Shafts; B17-1I & P17-I2 (Panel)
B18-137XX & RI-II5 (Rear)
76-1 (Switch)

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA DUMONT PART No.	IRC PART No.	NOTES
R10	10KΩ	½		BTS-10K	
R11	22KΩ	½		BTS-22K	
R12	820KΩ 5%	½		BTS-820K 5%	
R13	470KΩ 5%	½		BTS-470K 5%	
R14	68ΩΩ	½		BTS-680	
R15	4700Ω	½		BTS-4700	
R16	100KΩ	½		BTS-100K	
R17	22KΩ	½		BTS-22K	
R18	4700Ω	½		BTS-4700	
R19	1ΩΩΩ	½		BTS-1Ω	
R20	100KΩ	½	30037840	BTS-100K 5%	
R21	100KΩ	½	30032010	BTS-100K	
R22	390KΩ	½	30032080	BTS-390K	
R23	6200Ω	½	30031680		
R27	47ΩΩ	½	30032400	BTS-470	
R28	470Ω	½	30031610	BTS-47	
R29	22KΩ	½	30031920		
R30	47ΩΩ	½	30032400	BTS-470	
R31	1MΩ	½	30031580	BTS-1M	
R32	6800Ω	½	30031870	BTS-6800	
R33	3900Ω	½	30030980	BTS-3900 5%	
R34	100KΩ 5%	½	30030980	BTS-100K 5%	
R35	56KΩ	½	30031980	BTS-56K	
R36	47ΩΩ	½	30032400	BTS-470	
R37	180Ω	½	30031680	BTS-180	
R38	3300Ω	½	30031830	BTS-3300	
R39	6800Ω	½	30031870	BTS-6800	
R40	3900Ω	½	30031840	BTS-3900	
R41	3300Ω	½	30031830	BTS-3300	
R42	4700Ω	½	30034850	BTS-4700	
R43	3900Ω	½	30031840	BTS-3900	
R44	33Ω	½	30031660	BTS-33	
R45	470KΩ	½	30032090	BTS-470K	
R46	470KΩ	½	30032090	BTS-470K	
R47	100KΩ	½	30031610	BTS-100K	
R48	4500Ω	4	33233070		
R49	270Ω	½		BTS-270	Note 1
R50	51ΩΩ 5%	½		BTS-510 5%	Note 1
R51	1.5MEG	½	30032150	BTS-1.5Meg	
R52	47KΩ	½	30031970	BTS-47K	
R53	68KΩ	½	30031990	BTS-68K	
R54	33KΩ	½	30031950	BTS-33K	
R55	33KΩ	½	30032350	BTS-33K	
R56	68KΩ	½	30034900	BTS-68K	
R57	47KΩ	½	30031970	BTS-47K	
R58	270KΩ	4	33242090	BTS-270K	Note 2
R59	10KΩ	½	30031890	BTS-10K	
R60	47KΩ	½	30034970	BTA-47K	
R61	180K	½		BTS-180K	Note 2
R62	4700Ω	½	30031650	BTS-4700	
R63	100KΩ	½	30032540	BTS-100K	
R64	680KΩ	½	30032310	BTS-680K	
R65	4.7MEG	½	30032210	BTS-4.7Meg	
R66	68KΩ	½	30031990	BTS-68K	
R67	2200Ω	½	30031810	BTS-2200	
R68	330Ω	½	30031690	BTS-330	
R69	100KΩ	½	30032010	BTS-100K	
R70	12KΩ	½	30034900	BTA-12KΩ	
R71	33KΩ	½	30031830	BTS-33K	
R72	39ΩΩ	½	30031720	BTS-390	
R73	33KΩ	½	30031950	BTS-33K	
R74	18KΩ	½	30031910	BTS-18K	
R75	130KΩ	½	30032030	BTS-130K	
R76	120KΩ	½	30032020	BTS-120K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA DUMONT PART No.	IRC PART No.	NOTES
R77	1MEG	½	30031930	BTS-1Meg	
R78	1MEG	½	30032600	BTS-1Meg	
R79	1MEG	½	30032600	BTS-1Meg	
R80	470KΩ	½	30032090	BTS-470K	
R81	1MEG	½	30032130	BTS-1Meg	
R82	470Ω	½	30032090	PW4-500	
R83	370Ω	1	30034700	BTA-370	
R84	33KΩ	½	30031950	BTS-33K	
R85	220KΩ	½	30031950	BTS-220K	
R86	470KΩ	½	30032090	BTS-470K	
R87	22KΩ 5%	½	30030800	BTS-22K 5%	
R88	680KΩ 5%	½	30031950	BTS-680K 5%	
R89	330KΩ	½	30032070	BTS-330K	
R90	330KΩ	½	30032080	BTS-330K	
R91	150KΩ	½	30032550	BTS-150K	
R92	22KΩ	½	30031930	BTS-22K	
R93	120KΩ	½	30032030	BTS-120K	
R94	2.7MEG	½	30032180	BTS-2.7Meg	
R95	47KΩ	½	30031970	BTS-47K	Note 3
R96	180KΩ 5%	½		BTS-180K 5%	Note 4
R97	1MEG	½	30032150	BTS-1Meg	
R98	82ΩΩ 5%	½	30032460	BTS-820 5%	
R99	2300Ω	1	30034850	BTA-2300	
R100	330ΩΩ	½	30031810	BTS-3300	
R101	1000Ω 5%	½		BTS-1000 5%	
R103A	22KΩ	½	• 68000981	BTS-22K	
B	10KΩ	½		BTS-10K	
R103	820KΩ	½	30032120	BTS-820K	
R104	100KΩ	½	30032540	BTS-100K	
R105	2.7MEG	½	30032180	BTS-2.7Meg	
R106	3400Ω 5%	½	30030570	BTS-3400 5%	
R107	2.2MEG	½	30032320	BTS-2.2Meg	
R108	39KΩ	2	30037980	BTS-39K	
R109	39KΩ	2	30037980	BTS-39K	
R110	330ΩΩ	1	30031810	BTS-3300	
R111	68KΩ	1	30034990	BTA-68K	
R112	82KΩ	1	30034990	BTA-82K	
R113	33ΩΩ	1	30034990	BTA-330	
R114	47KΩ	½	30037720	BTS-470	
R115	56ΩΩ				
R116	56ΩΩ				
R117	100KΩ		30032010		
R118	100KΩ		30032010		
R119	100KΩ		30032010		
R120	4.7MEG	½	30032310	BTS-4.7Meg	
R121	12KΩ 5%	½	30033740		
R122	27KΩ	1	30034940		
R123	2700Ω 5%	½	30030580		
R124	220KΩ 5%	½	30030980		
R125	100KΩ 5%	½	30030680		
R126	10KΩ 5%	½	30030720		
R127	68ΩΩ				
R128	560KΩ		30032100	BTS-560K	
R129	180KΩ		30031910	BTS-180K	
R130	15KΩ	½	30031910		
R131	1200Ω	1	30034780		
R132	120ΩΩ	1			
R133	720ΩΩ	10		PW10-7500	Note 5
R134	470ΩΩ	2	30034850	BTS-4700	Note 5
R135	10KΩ	½	30037890	BTS-10K	
R136	100ΩΩ	½			
R137	15KΩ	½	30034930		
R138	10KΩ	½	30033460		
R139	2000Ω	10	32213000	PW10-2000	
R140	40ΩΩ	4	33233100	PW4-400	
R141	100KΩ	1	30045010	BTA-100K	

Note 1. In some versions, R49 and R50 are replaced with a single 180Ω ½W resistor.
Note 2. Not used in some versions.
Note 3. Some versions use a 33KΩ ½W resistor in this application.
Note 4. Some versions use a 100KΩ ½W resistor in this application.
Note 5. In some versions, R132, R133 are replaced with a single 3500Ω 10W resistor.
• Items R103A, R103B, C84A, C84B are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA DUMONT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T1	117VAC	525VCT @ 300A	5V @ 6A	6.3V @ 1.4A	30009901 ①			P2830 ④		R-51BC ③

① Used in some versions.
② Parallel and phase 6.3V ⓖ 5A and 6.3V ⓖ 1.2A windings.
③ Parallel 6.3V ⓖ 6A windings tape 6.3V ⓖ 1.2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA DUMONT PART No.	Halldorson PART No.	Merit PART No.	ECA TYPE No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	30009781	S6704	A-3003	20971 ①	V405	A-8125	26A03	A-97X
T3	Horiz. Output Trans.	30009781	PS419 & RF800 •	HVO-35 •	23571 & 21481 •	X094 •	A-8253 •	FLY18 & WC-20 •	U-50 & WC-11 •
T4	Vert. Output Trans.	30009712	21900 ② ③	A-3038 ② ③		V318 ③	A-8143 ② ③	26853 ② ③	A-107X ③
T5A	Yoke(90°)Horiz.(42MH)	2101388	DF807 ③	MDY-92 ③	23501 ③	Y90F18/43 ③	DY-16A ③	Y-16 ③	Y-41-1 ③
B	Vert. (42MH)	2900171 ④							
T6	Horiz. Size Coil	21011013	RF800 ③	MWC-6	21UR1 ①	20UR15 ①	WC-8 ①	WC-22 ①	WC-12 ①

① Drill new mounting hole(s).
② Use 11.4 to 1 turns ratio.
③ Connect as auto transformer.
④ Alternate deflection yoke.
⑤ Use original rear cover and centering device.
⑥ Use terminals 3 and 4.
⑦ Centering device and yoke cover.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	ECA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
9	9	9	9	9	9	9	9
8	7	7	7	7	1	7	7
T	4	4	4	3	3	3	4
3	3	3	3	1	4	4	3
4	6	6	Term "D" of 21481	2	7	Term 1	Grg. Term of WC-11
7	3	3	Term "E" of 21481	6	6	Term 2 of WC-20	Black Term of WC-11
Connect Width Coil Across			Terms "A" & "B" of 21481 across 3 & 1			Terms 3 & 4 of WC-20 across 3 & 1	Red & Blue Terms of WC-11 across 3 & 1
Special Notes							

③ If picture is out of phase, reverse either the primary or secondary windings of width coil.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA DUMONT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T7	5.3KΩ	3.2Ω Tap @ 1.6Ω	30009791						

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA DUMONT PART No.	QUAM PART No.	ECA TYPE No	NOTES
SP1	6"	PM	3-4Ω	18003704 ①	8A1	22381	① Used in Chassis RA343, RA342.
	6"	PM		18003702 ②	8A1	22381	② Used in Chassis RA340, RA341.
	8"	PM		18003732 ③	8A2I	20382	③ Used in Chassis RA340, RA341, RA343, RA343
	10"	PM		18003972 ③	10A2I	23381	RA345.
	10"	PM		18003981 ④	10A2I	23381	④ Hi-freq. speaker - Chassis RA343, RA343
		PM		18003782 ④			

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA DUMONT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Matching Trans.	.8Ω	.6Ω					
L2	Ant. Matching Trans.	.8Ω	.6Ω					
L3	IF Trap	0Ω						
L4	Ant. Coils	0Ω						
L5	UHF IF Coil	0Ω						Tapped
L6	Ant. Shunt Coils	0Ω						High Channels
L7	Ant. Shunt Coils	0Ω						Low Channels
L8	Fil. Choke	0Ω						
L9	Neut. Coil	0Ω						
L10	Parasitic Suppressor	0Ω						1 Turn Wire On 10Ω Resistor, Channel 13
L11	RF Coil	0Ω						
L12	RF Coils	0Ω						
L13	RF Coils	0Ω						
L14	UHF IF Coil	0Ω						
L14	RF Coil	0Ω						
L15	Mixer Grid Coil	0Ω						Channel 13
L16	Mixer Grid Coils	0Ω						
L17	UHF IF Coil	0Ω						
L18	Osc. Coil	0Ω						Channel 13
L19	Osc. Coils	0Ω						
L20	Conv. Plate	.1Ω	.2Ω					
L21	41.25MC Trap	0Ω		21013921			6236	
L22A	39.75MC Trap	.1Ω		21013761				
B	47.25MC Trap	.1Ω						
L23	1st Video IF	.1Ω	.1Ω	20010071				
L24	Fil. Choke	0Ω		21017783	19-1001		4604	
L25	2nd Video IF	.1Ω	.1Ω	20008991	17-4522	TV-130	6219	
L26	Fil. Choke	0Ω		21017783	19-1001		4604	
L27	3rd Video IF	.1Ω	.1Ω	20008991	17-4524	TV-130	6319	
L28	4th Video IF	.1Ω	.1Ω	20008993	17-4524	TV-130	6319	
L29	Series Peaking Coil	4.5Ω		21013481			6635	27 Microhenries
L30	Shunt Peaking Coil	9.2Ω		21006638	19-4201	TV-104	6154	197 Microhenries
L31	Series Peaking Coil	5.2Ω		21006632	19-3100	TV-181	6177	100 Microhenries
L32	4.5MC Trap	1.8Ω		21013782	30-1004	TV-151	1469	
L33	Shunt Peaking Coil	18Ω		21006627	19-4400		6134	370 Microhenries
L34	Series Peaking Coil	6.2		21006633	19-3100	TV-181	6177	100 Microhenries
L35	Series Peaking Coil	10.5Ω		21013864	19-3250	TV-185	6181	330 Microhenries
L36	Shunt Peaking Coil	9.5Ω		21006628	19-4201	TV-184	6154	197 Microhenries
L37	Series Peaking Coil	4.5Ω		21013451			6635	27 Microhenries
L38	1st Sound IF	1.8Ω		21013782	30-1004	TV-151	1469	
L39	2nd Sound IF	9Ω		21013913				
L40	Ratio Det.	4.7Ω	.7Ω CT	20009043	17-3497•	TV-115•	6305•	Tertiary Winding - .6Ω
L41	RF Choke	5.1Ω		21006550	19-1005		4612	6.2 Microhenries; IRC Part #CL-1.
L42	RF Choke	6.1Ω		21006550	19-1005		4612	8.2 Microhenries; IRC Part #CL-1
L43	RF Choke	5Ω		21013198				2770 Microhenries

• Use Adaptor Plate.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	DUMONT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L44	53Ω		21010992	19-1576	TV-163	6210			HS-5	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	DUMONT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L45	.300A	42Ω	1.9HY	21010954	C5037	C2996	C2326 ①	26C44 ①	C-17X

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			DUMONT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG Slo-Blo	3/4A 250V	11005230	13110001	313.750 (3AG Slo-Blo 3/4A)	357001	MDL 3/4	4405

CRYSTAL DIODES

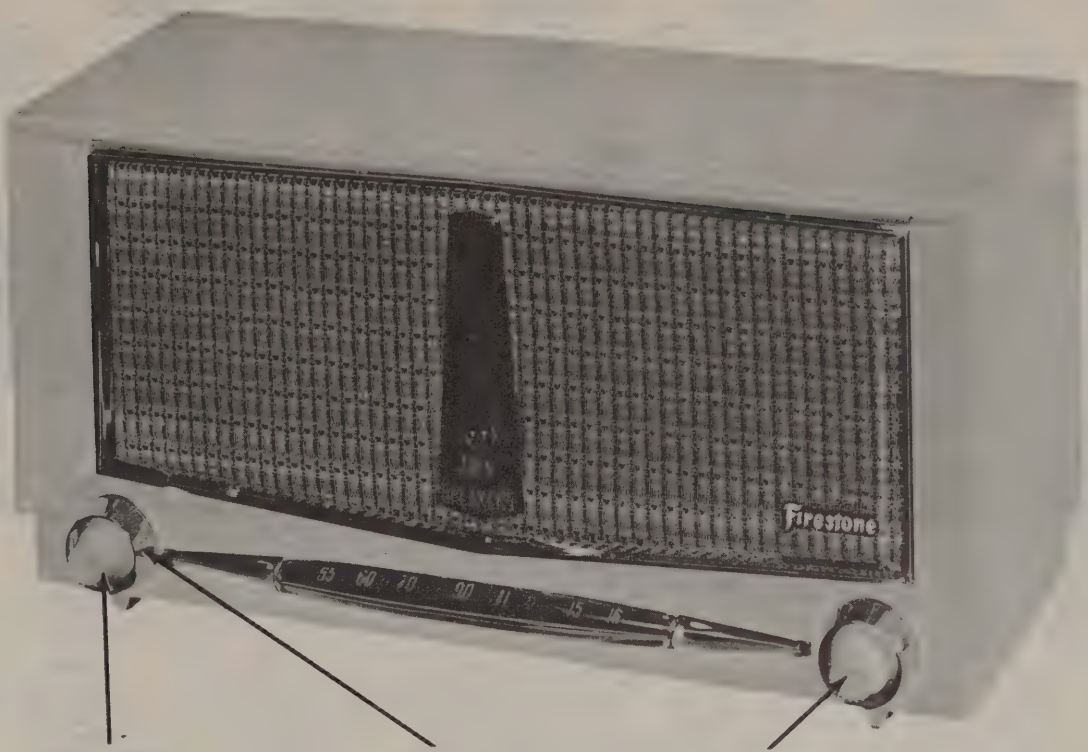
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		DUMONT PART No.	SYLVANIA PART No.	
M2	CK706A	26001891	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	DUMONT PART No.	NOTES
M3	Dial Light	12001310	#47
M4	Tuner	89013751*	VHF - All Chassis.
M5	Tuner	89013771	UHF - Chassis RA-341, RA-343.
M6	Switch	05005120	TV - Phono (3 Pole-2 Position; Slide Type).
M7	Centering Device	29000771	Includes Deflection Yoke (T5) Rear Cover.
M8	Ion Trap	29000665	
	Knob	45006451	Channel Selector - Templer, Conover, Croft, Culver, Darien, D'Orsay, Douglas Models.
	Knob	45006493	Channel Selector - Thorndyke Models.
	Knob	45006452	On-Off-Volume - Templer, Conover, Croft, Culver, Darien, D'Orsay, Douglas Models.
	Knob	45006494	On-Off-Volume - Thorndyke Models.
	Knob	45006461	Fine Tuning - Chassis RA-340, RA-342; Templer, Conover, Croft, Culver, Darien, D'Orsay & Douglas Models.
	Knob	45006463	Fine Tuning - Chassis RA-341, RA-343; Templer, Conover, Croft, Culver, Darien, D'Orsay, Douglas Models.
	Knob	45005968	Fine Tuning - Chassis RA-342 - Thorndyke Models.
	Knob	45005969	Fine Tuning - Chassis RA-343 - Thorndyke Models.
	Knob	45006462	Brightness - Templer, Conover, Croft, Culver, Darien, D'Orsay, Douglas.
	Knob	45005976	Brightness - Thorndyke Models.
	Dial	45006471	UHF - Chassis RA341; Templer, Conover, Croft Models.
	Dial	45006481	UHF - Chassis RA-343; Thorndyke, Culver, Darien, D'Orsay, Douglas Models.
	Safety Glass	45006033	Chassis RA-349, RA-341.
	Safety Glass	45006438	Chassis RA-342, RA-343; Thorndyke Models.
	Safety Glass	45006437	Chassis RA-342, RA-343; Culver, Darien, D'Orsay, Douglas Models.
	Mask	64011354	Chassis RA-340, RA-341
	Mask	64011811	Chassis RA-342, RA-343; Thorndyke Models.
	Mask	64011812	Chassis RA-342, RA-343; Culver, Darien, D'Orsay, Douglas Models.

* Alternate Part #89013771.

FIRESTONE
MODEL 4-A-143 (Code 382-5-392)



FIRESTONE
MODEL 4-A-143 (Code 382-5-392)

TRADE NAME	Firestone Model 4-A-143 (Code 382-5-392)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC
RATING	.28 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A6	"

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PARTS LIST AND DESCRIPTIONS

FIRESTONE
4-A-143

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		FIRESTONE PART No.	STANDARD REPLACEMENT	
V1	Converter	12BE6	12BE6	
V2	IF Amp.	12BA6	12BA6	
V3	Det. -AVC-AF Amp.	12AT6	12AT6	
V4	Audio Output	50C5	50C5	
V5	Rect.	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FIRESTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	70	150	43373			WQ-250	CDB-1013	Q-120	
B	30	150							
C	30	150							
D	20	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47
C3A	100		♦25430	♦PA-97-1	♦PC-50	♦111TM1	♦1403-01	UC-531	♦D-1
B	100							UC-531	
C4	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47
C5	.0022	600		SI2200	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22
C6	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22
C7	.0022	600		SI2200	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22
C8	.001	600		SI1000	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1
C9	.01	600		BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1
C10	.0047	600		SI4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47
C11	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47
C12	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47

♦ Items C3A, C3B and R4 are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½	43282	F1-41		QJ-868R †	UF55A	Tone (Panel)
B	500KΩ	½		R2-41			UR55A ♦	Volume (Rear)
C	Switch			KB-1			US-26	Attach to R1A.

♦Universal Replacement (Mallory Exact Duplicate Part No. UE1395S).
†CONCENTRIKIT EQUIVALENT; K-6 KIT, BASE ELEMENTS AND SHAFTS; B13-133, P17-115 (Panel)
B13-133, R1-126 (Rear)
76-1 (Switch)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	2.2Meg	½		BTS-2.2Meg	
R4	47KΩ	½	♦25430	BTS-47K	
R5	10Meg	½		BTS-10Meg	
R6	100KΩ	½		BTS-100K	
R7	330KΩ	½		BTS-330K	

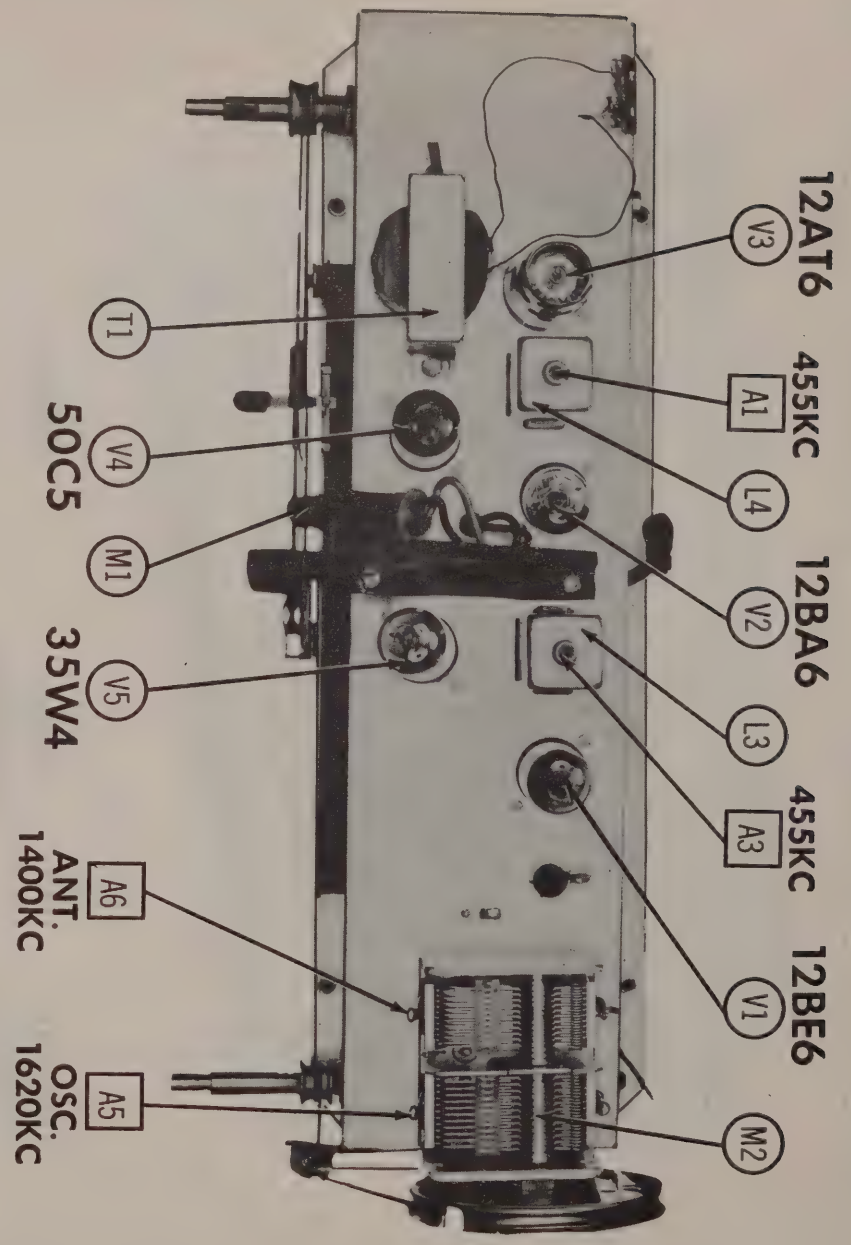
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R8	220KΩ	½		BTS-220K	
R9	1500Ω	½		BTS-1500	
R10	150Ω	½		BTS-150	
R11	1500Ω	1		BTA-1500	
R12	100Ω	1½		BTS-100	
R13	330KΩ	1½		BTS-330K	

♦ R4, C3A, C3B are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.3KΩ	3.2Ω	43393-1	Z1102	A-3031	A-3336	24S50A	S-16X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	FIRESTONE PART No.	QUAM PART No.	
SP1	5"	PM	6.4Ω	43365-1	5A1Z6.4	
SP2	5"	PM	6.4Ω	43365-1	5A1Z6.4	

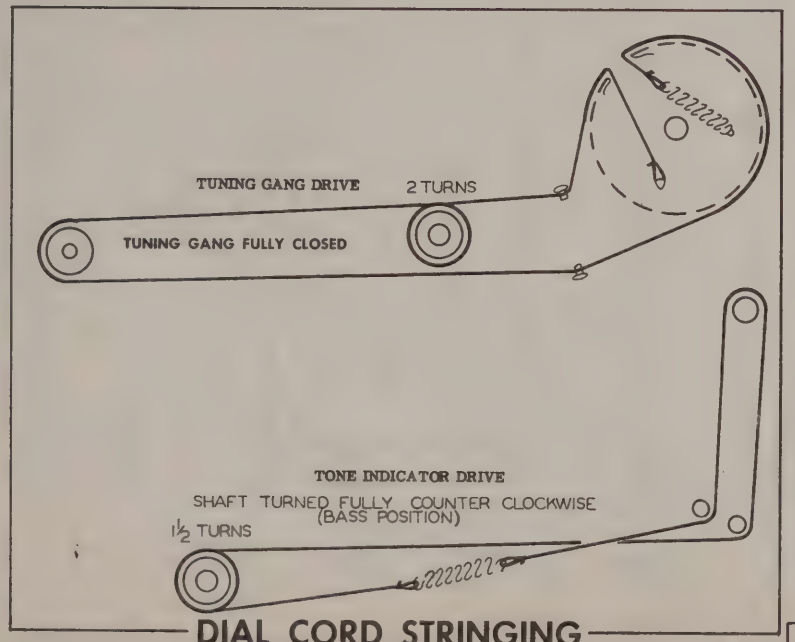
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.6Ω		43395-1				
L2	Osc. Coil	.6Ω	6.7Ω	25192-1	14-1073*		69-Osc.	
L3	Input IF	14Ω	14Ω	40845-1	16-6758	BC-352	12-C1	
L4	Output IF	14Ω	14Ω	40845-1	16-6758	BC-353	12-C2	

* Leads sufficient mounting support.

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M1	Dial Light	19351	#47
M2	Tuning Cap.	43290	2 Gang (14-340MMF, 23-170MMF)
	Cabinet	43397-7	Blue
	Cabinet	43397-6	Ivory
	Knob	43284-7	On-off-volume & tuning - blue
	Knob	43284-6	On-off-volume & tuning - ivory
	Knob	43284-3	Tone- blue
	Knob	43285-2	Tone - ivory
	Dial Scale	43299	
	Pointer	43391-1	Radio
	Pointer	43392-1	Tone

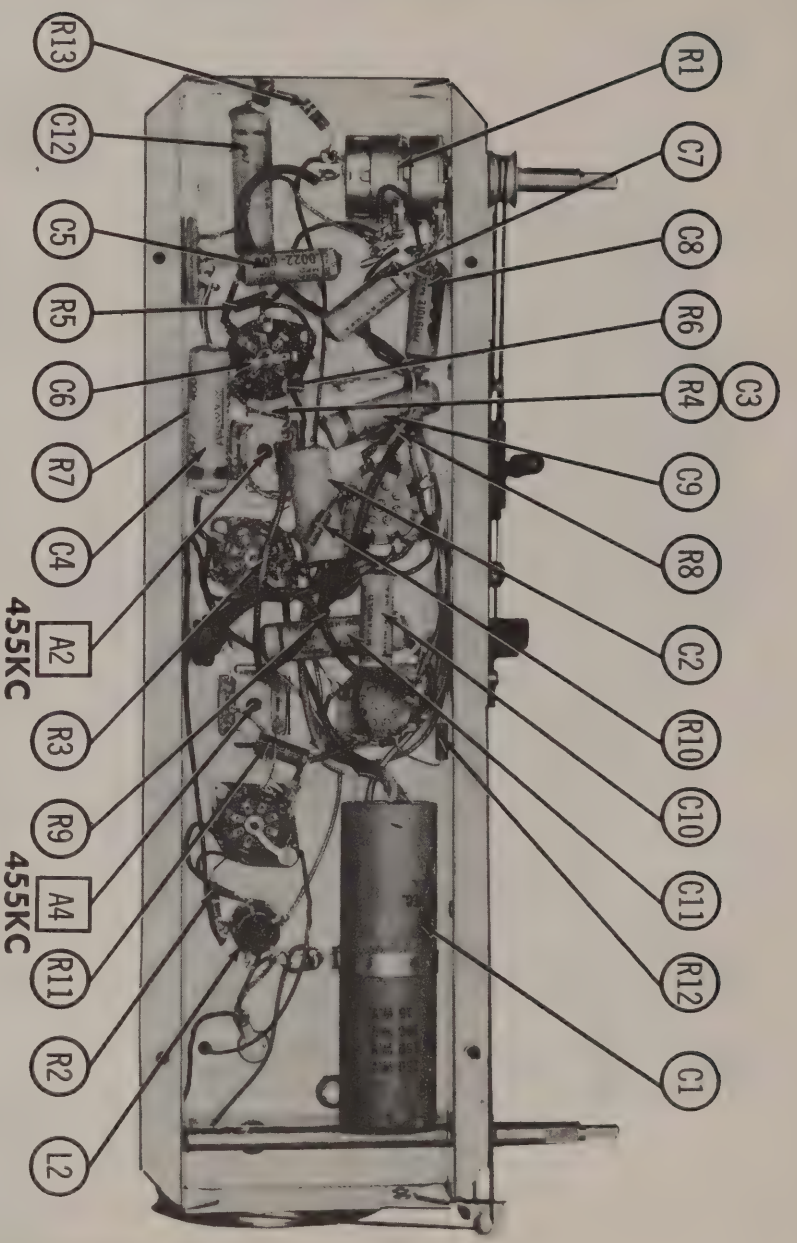


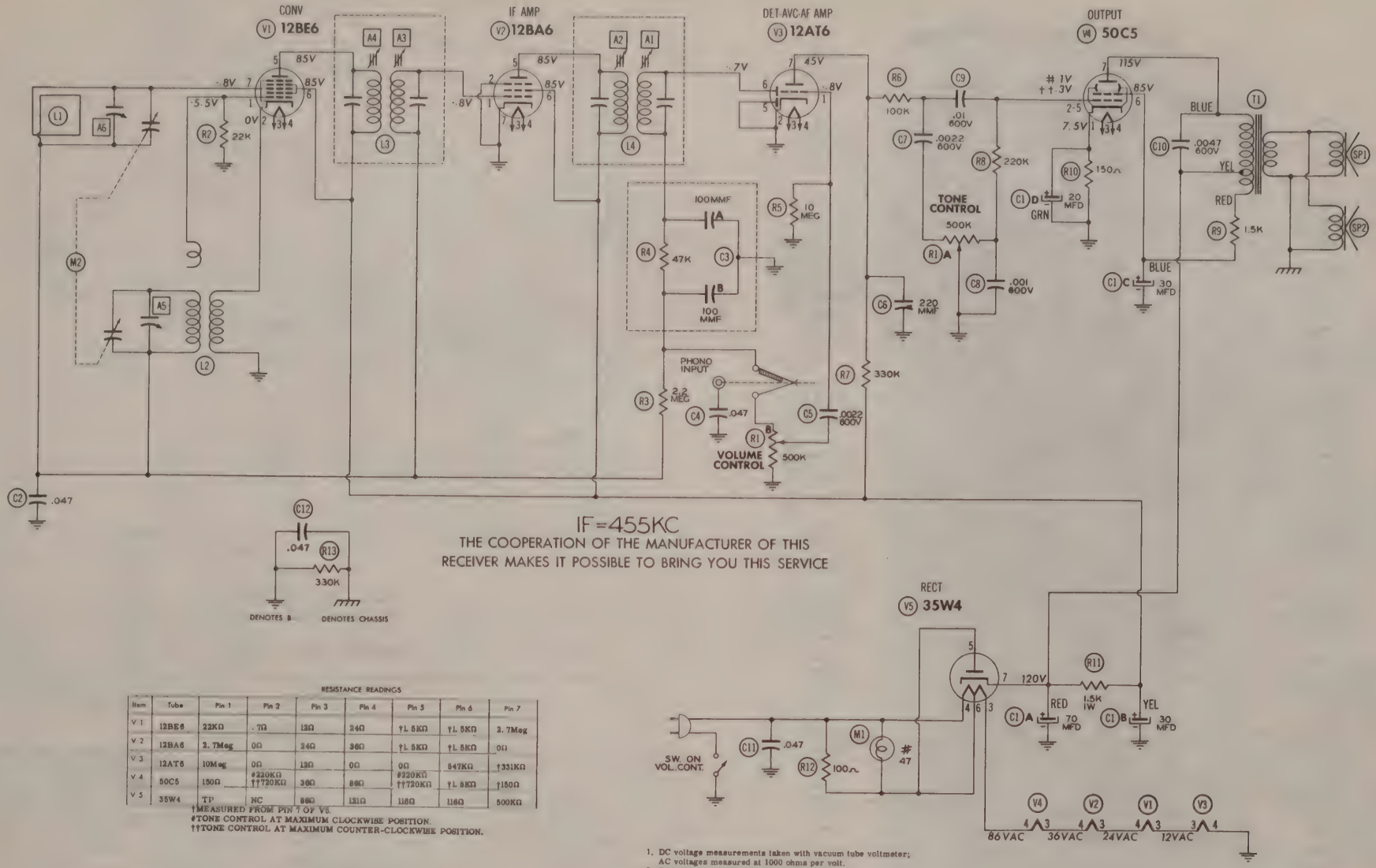
DIAL CORD STRINGING

FIRESTONE 4-A-143

SET 318 FOLDER 5

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.7Ω	12Ω	24Ω	†1.5KΩ	†1.5KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	34Ω	36Ω	†1.5KΩ	†1.5KΩ	0Ω
V 3	12AT6	10Meg	0Ω	12Ω	0Ω	0Ω	547KΩ	†331KΩ
V 4	50C5	150Ω	#220KΩ ††720KΩ	36Ω	86Ω	#220KΩ ††720KΩ	†1.5KΩ	†150Ω
V 5	35W4	TP	NC	86Ω	121Ω	116Ω	116Ω	500KΩ

†MEASURED FROM PIN 7 OF V6.
#TONE CONTROL AT MAXIMUM CLOCKWISE POSITION.
††TONE CONTROL AT MAXIMUM COUNTER-CLOCKWISE POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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FIRESTONE
MODEL 4-B-76 (Code 120-5-F145)

FIRESTONE
MODEL 4-B-76 (Code 120-5-F145)

TRADE NAME	Firestone Model 4-B-76 (Code 120-5-F145)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Six)	Types: 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AV6 (or) 6AT6 Det.-AVC-AF Amp., 6AQ5 Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5 Amp. @ 6.3Volts DC
TUNING RANGE—BROADCAST	538KC-1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400%Mod.)	Tuning gang fully open.	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output.
2.	68MMF	High side to antenna receptacle. Low side to chassis.	1610KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal.	"	A6, A7	"
4.	"	"	600KC	Tune to 600KC signal	"	A8, A9	Adjust for maximum output. Repeat step 3.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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PARTS LIST AND DESCRIPTIONS

FIRESTONE
4-B-76

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		FIRESTONE PART No.	STANDARD REPLACEMENT	
V1	RF Amp.	6BA6	6BA6	
V2	Converter	6BE6	6BE6	
V3	IF Amp.	6BA6	6BA6	
V4	Det. -AVC-AF Amp.	6AV6	6AV6	6AT6 used as an alternate.
V5	Output	6AQ5	6AQ5	
V6	Rect.	6X4	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FIRESTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	350	CE-86	AFH3-107	C080	FP345.8	TM-3029	T-470	TVL-3632
B	▲20	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.
C2A	.1	400	CX104-4	JP430-3X.1	DF-104	DYR6111		CRT602	BP-31
B	.1	400			DF-104				
C	.1	400			DF-104				
C3	100		CC101	BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1
C4A	220								
B	5000								
C	5000		♦PC-151	♦PA-113-2	♦PC-151	♦116TM2	♦1408-02		♦DT-2
D	250								
E									
C5	4000	500	(Note 1)	1464-004		1R5D4		MCB463	MS-24
C6	.015	400	(Note 2)	BPD-015	DD16-153	CUB6S15		PT6115	6TM-S15
C7	.01	600	C103-6	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1
C8	.008	1600	C802-16	DAC-26	DD16-802	CUB16D8		PT1628	MB-D8
C9	.5	100	C504-1	VHC36		MP2P5		RF480	68P20
C10	.5	100	C504-1	VHC36		MP2P5		RF480	68P20

Note 1. Some versions may use a .002MFD unit in this application.
Note 2. Some versions may use a .01MFD unit in this application.
♦ Items C4A, C4B, C4C, C4D, C4E, R9A, R9B and R9C are combined in one unit. When replacing items separately, C4D and C4E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½	RV-145	ABT-66	A47F2-500K	Q13-133X	UT-430	Volume (Tap at 180KΩ)
B	Shaft	½	Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	KB-4	SWE-12	76-1	US-26	Attach to R1A.
R2A	2Meg	½	RV-146	B-76	A47-2Meg-Z	Q13-139	U-55	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.

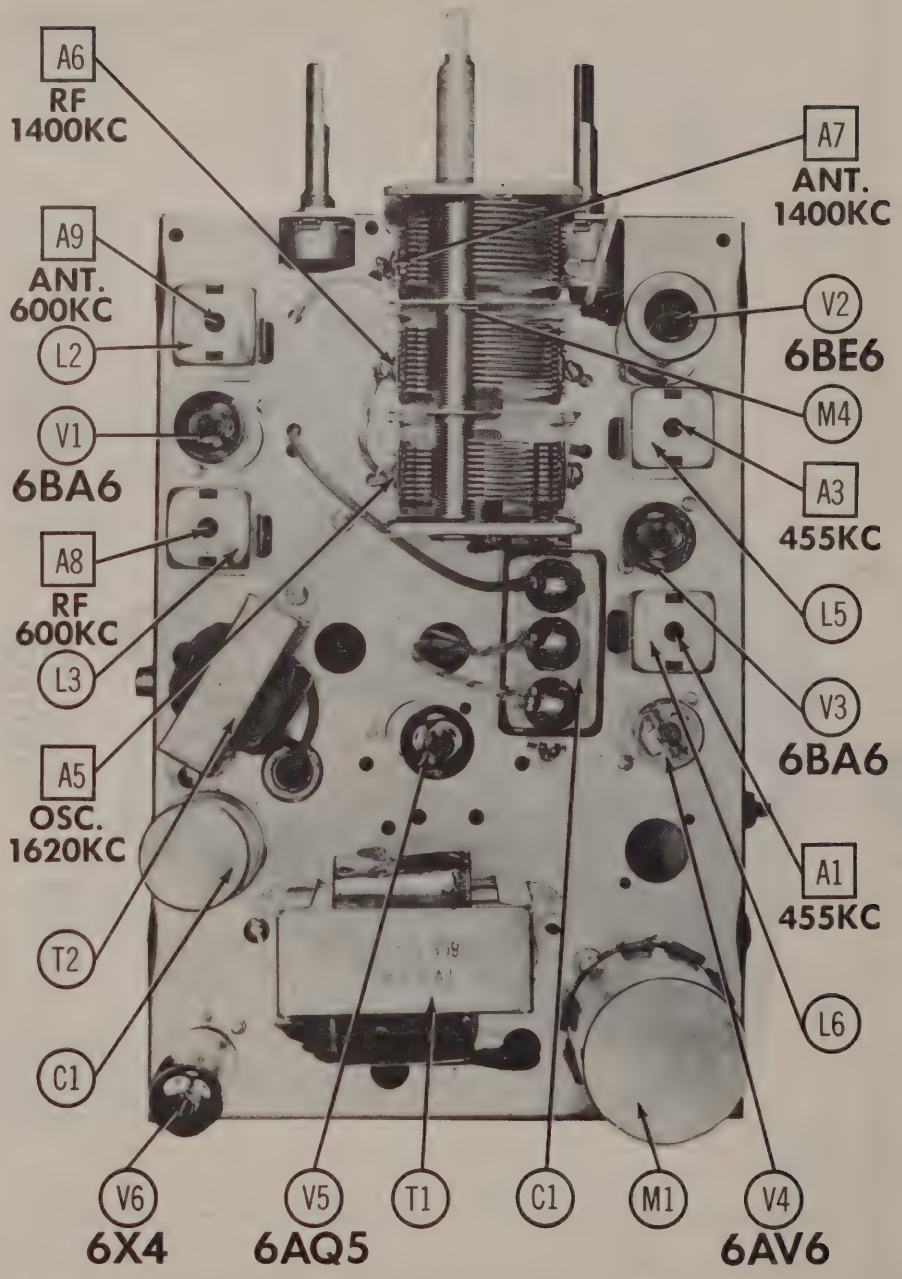
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R3	1.2Meg	½	R125	BTS-1.2Meg	
R4	470Ω	½		BTS-470	Note 1
R5	22KΩ	½	R223	BTS-22K	
R6	22KΩ	2	R223-2	BTB-22K	
R7	1500Ω	½		BTS-1500	Note 2
R8	2.2Meg	½	R225	BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R9A	6.8Meg	½	♦PC-151	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R10	22KΩ	½	R223	BTS-22K	
R11	330Ω	½	R331	BTS-330	
R12	1000Ω	1	R102-1	BTA-1000	
R13	82Ω	½	R820	BTS-82	
R14	82Ω	½		BTS-82	

Note 1. Some versions may use a 560Ω ½W resistor in this application.
Note 2. Some versions may use a 2700Ω ½W resistor in this application.
♦ Items C4A, C4B, C4C, C4D, C4E, R9A, R9B, R9C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	6.3VCT 3A	470VCT .053A			TV-100C		P-2970		22R20 ①	

① Remove frames, use channel frame packaged with unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5.2KΩ	3.7Ω	TO-4502	Z1107	A-2930	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	FIRESTONE PART No.	QUAM PART No.	
SP1	6" x 9"	PM	3.7Ω	PM-901	69A3	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. RF Choke	1.1Ω		L200	19-1005*		4624*	
L2	Ant. Coil	44Ω	4.6Ω	57FB-3				
L3	RF Coil	90Ω	6.3Ω	57FB-4				
L4	Osc. Coil	5.7		L201	14-1033■	BC-381■	71-Osc.■	Tapped ⓐ .6Ω
L5	Input IF	15Ω	15Ω	1655-6	16-6758	BC-352	12-C1	
L6	Output IF	15Ω	15Ω	1655-6	16-6758	BC-353	12-C2	
L7	Vib. Hash Choke	0Ω		L202				
L8	Fil. Choke	0Ω		L203	19-4215	BC-537	5221	

* Connect in series with 10MMF Cap.
■ Drill mounting hole.

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				FIRESTONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interruptor	6.3V	115∿	V-83 V-83A ①	5301	859	5301	① Alternate vibrator

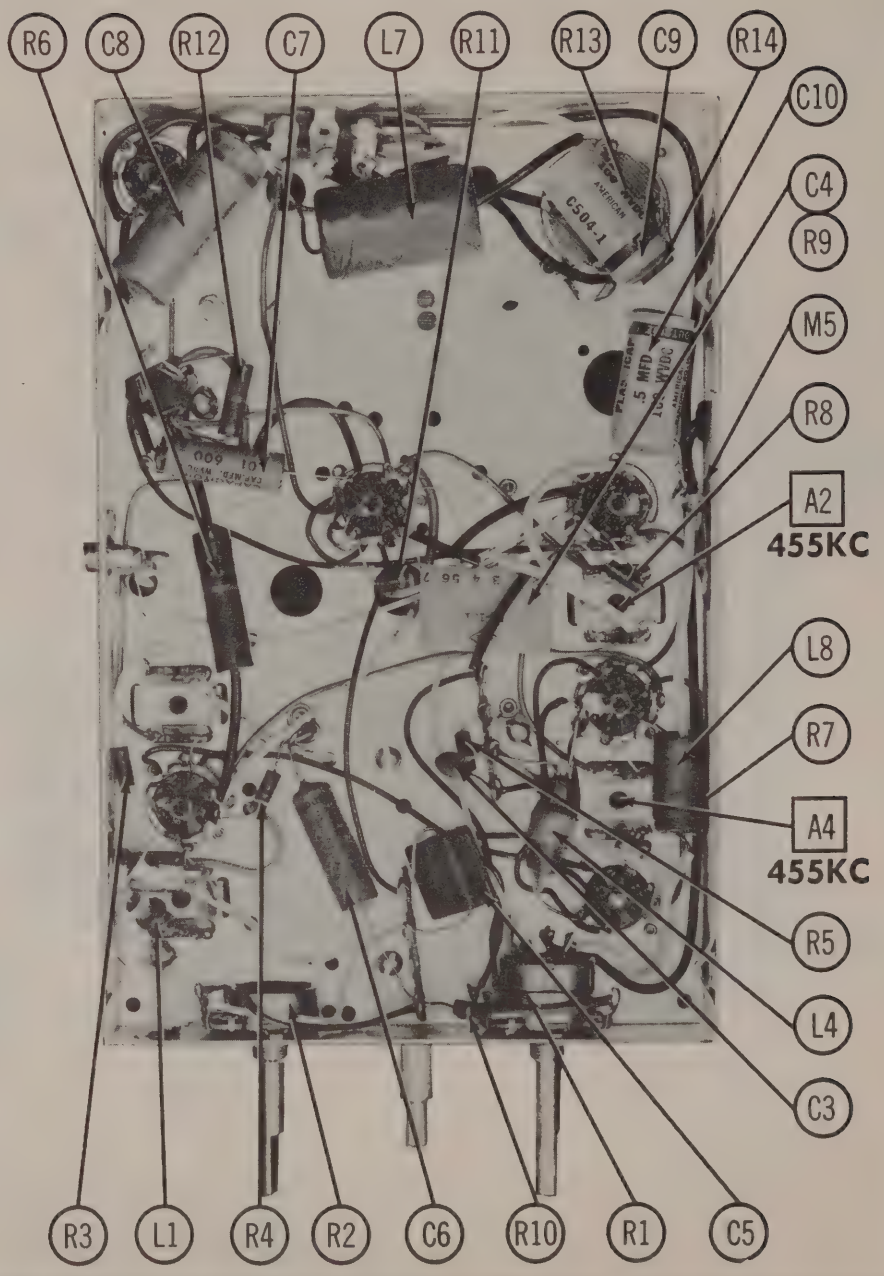
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FIRESTONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	A200	FH256	307014. (SFE14A)	155014	SFE14	HRI

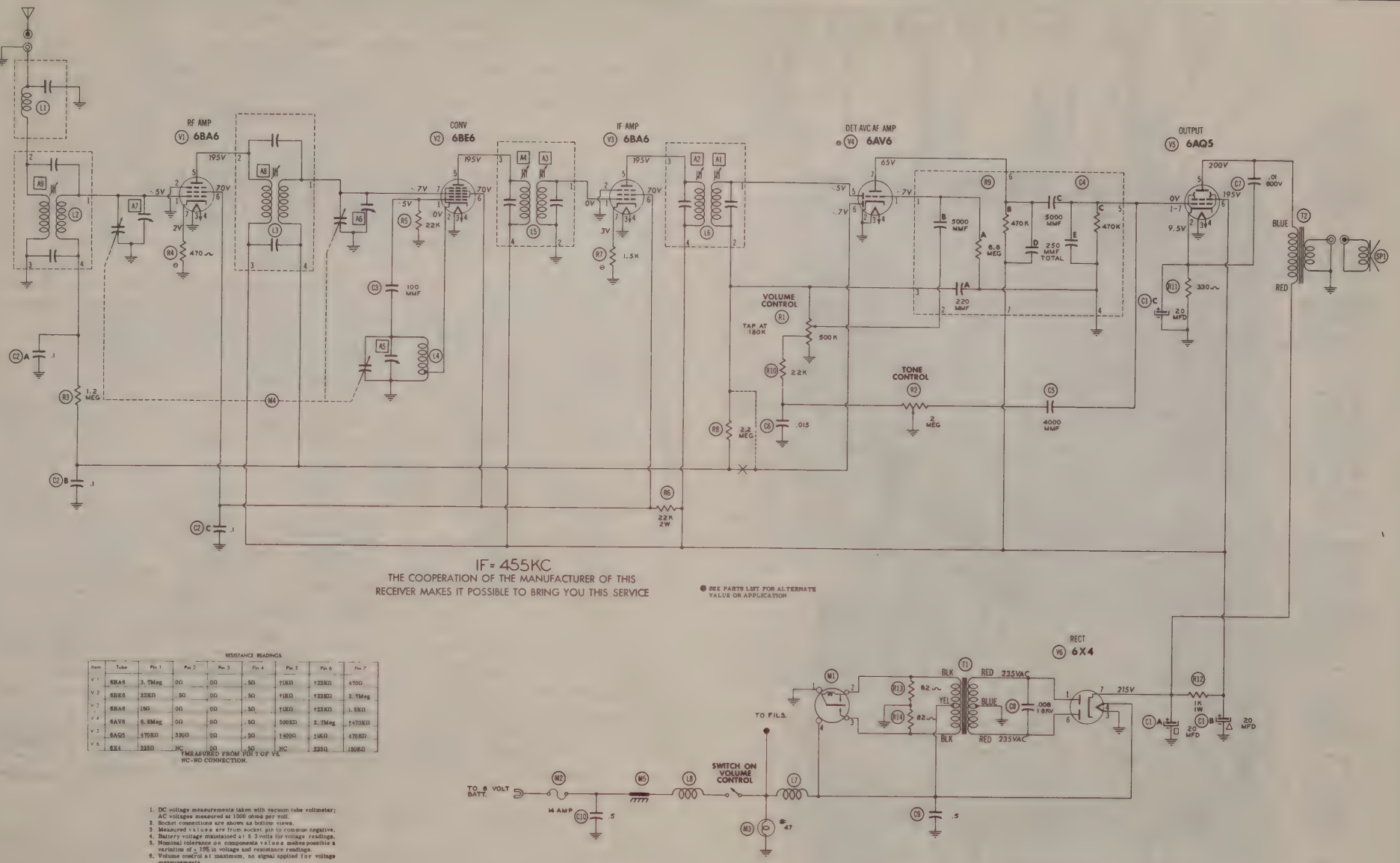
MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M3	Dial Light	T-47	#47
M4	Tuning Cap.	CV-145	3 Gang (20-375MMF, 20-375MMF, 31-195MMF)
M5	Spark Plate		
	Knob	H5F3	Tuning
	Knob	H38	Tone & on-off-volume

CHASSIS—BOTTOM VIEW



SET 318 FOLDER 5



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	3.7Meg	0Ω	0Ω	.5Ω	†1KΩ	†22KΩ	470Ω
V 2	6BE6	22KΩ	.5Ω	0Ω	.5Ω	†1KΩ	†22KΩ	2.7Meg
V 3	6BA6	1.5Ω	0Ω	0Ω	.5Ω	†1KΩ	†22KΩ	1.5KΩ
V 4	6AV6	6.8Meg	0Ω	0Ω	.5Ω	500KΩ	2.7Meg	†470KΩ
V 5	6AQ5	470KΩ	330Ω	0Ω	.5Ω	†400Ω	†1KΩ	470KΩ
V 6	6X4	225Ω	NC	0Ω	.5Ω	NC	335Ω	150KΩ

†MEASURED FROM PIN 7 OF V6
NC-NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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HALLICRAFTERS MODEL 21T360M

TRADE NAME	Hallicrafters	MODELS	CHASSIS
		21K370B, 21K370M, 21T360B, 21T360M	A1800D
		21K371B, 21K371M, 21T361B, 21T361M	B1800D
		24K380B, 24K380M, 24K480B, 24K480M	C1800D
		24K381B, 24K381M, 24K481B, 24K481M	D1800D
MANUFACTURER	The Hallicrafters Co., 4401 W. 5th. Ave., Chicago 24, Illinois		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 1.24 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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Tube Placement Chart (Top View) 5

L. F. [illegible] RENSHAW
3924 MEADE ST.,
DENVER, COLORADO

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.

2. Remove 4 wood screws from under bottom of escutcheon panel. Remove escutcheon panel and 3 remaining control knobs.

3. Remove 6 wood screws. Remove rear cover.

4. Disconnect speaker leads, picture tube socket, HV lead and yoke plug. Remove 1 metal screw and remove ground strap from picture tube.

5. Remove 1 wood screw holding antenna terminal bracket.

6. Remove 5 chassis mounting bolts. Remove chassis.

7. Remove 2 wing nuts. Remove speaker.

PICTURE TUBE REMOVAL

1. Remove chassis as outlined above.

2. Remove 2 wood screws holding brackets which support yoke housing.

3. Lay cabinet face down on a soft surface and remove 4 nuts holding picture tube assembly to cabinet.

4. Lift entire picture tube assembly from cabinet.

MODELS	CHASSIS
21K370B, 21K370M, 21T360B, 21T360M	A1800D
21K371B, 21K371M, 21T361B, 21T361M	B1800D
24K380B, 24K380M, 24K480B, 24K480M	C1800D
24K381B, 24K381M, 24K481B, 24K481M	D1800D

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 5 wood screws holding plastic strip at the top edge of the safety glass. Remove strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the set. Adjustment is located on top of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, it is necessary to remove the rear cover and supply power to the set. Adjust the buzz control (R7) for maximum volume and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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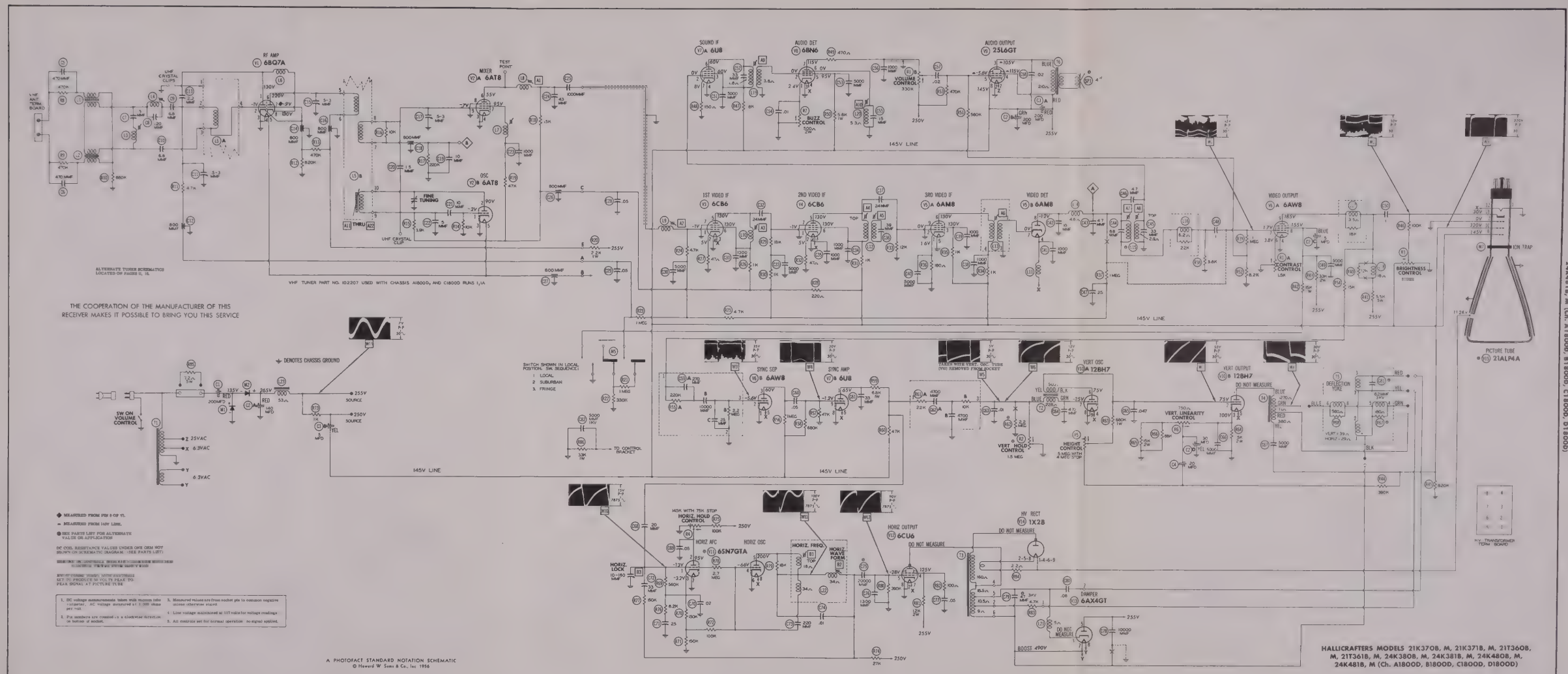
G255

DATE 5-56 SET 318 FOLDER 7


RF AMP V1 6BQ7A
MIXER V2A 6AT8
OSC V2B 6AT8
SOUND IF V7A 6U8
AUDIO DET V8 6BN6
AUDIO OUTPUT V9 25L6GT
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5A 6AM8
VIDEO DET V5B 6AM8
VIDEO OUTPUT V1A 6AW8
SYNC SEP V6B 6AW8
SYNC AMP V7B 6U8
VERT OSC V10A 12BH7
VERT OUTPUT V10B 12BH7
HORIZ OUTPUT V12 6CU6
HV RECT V14 1X2B
DAMPER V13 6AX4GT
HORIZ AFC OSC V11 6S7GTA
PICTURE TUBE V15 21ALP4A
VOLUME CONTROL
BUZZ CONTROL
CONTRAST CONTROL
BRIGHTNESS CONTROL
VERT HOLD CONTROL
HEIGHT CONTROL
VERT LINEARITY CONTROL
HORIZ HOLD CONTROL
HORIZ. FREQ.
HORIZ. WAVE FORM
FINE TUNING
ION TRAP
DEFLECTION YOKE
145V LINE
SW ON VOLUME CONTROL
DENOTES CHASSIS GROUND
TD CONTROL BRACKET
UHF CRYSTAL CLIPS
UHF ANT. TERM. BOARD
TEST POINT
H.V. TRANSFORMER TERM. BOARD
ALTERNATE TUNER SCHEMATICS LOCATED ON PAGES 11, 16.
VHF TUNER PART NO. 102207 USED WITH CHASSIS A18000, AND C18000 RUNS 1,1A
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
SWITCH SHOWN IN LOCAL POSITION. SW. SEQUENCE: 1. LOCAL 2. SUBURBAN 3. FRINGE
◆ MEASURED FROM PIN 5 OF V1.
▬ MEASURED FROM 145V LINE.
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER OHM NOT SHOWN ON SCHEMATIC DIAGRAM - SEE PARTS LIST)
1. DC voltage measurements taken with vtvm into voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted as a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation no signal applied.
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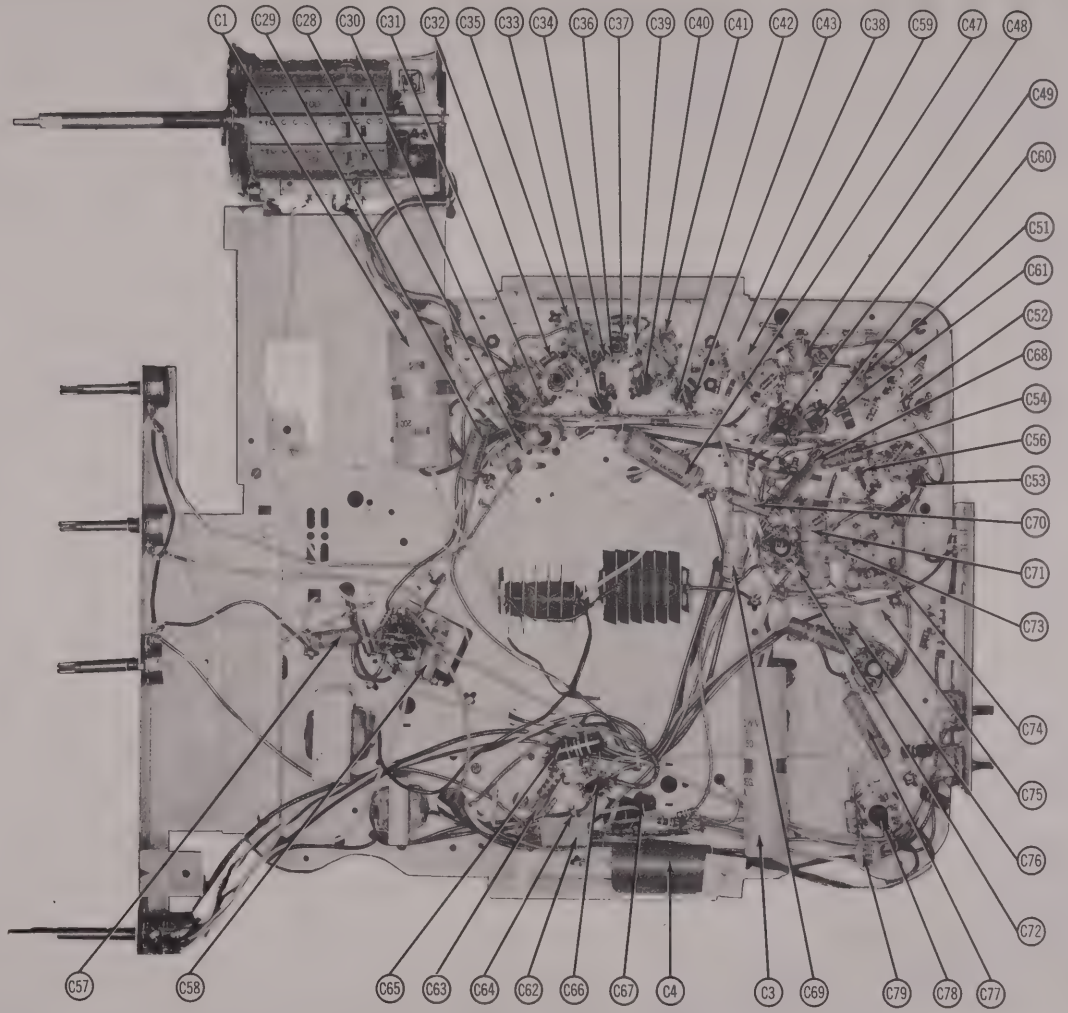
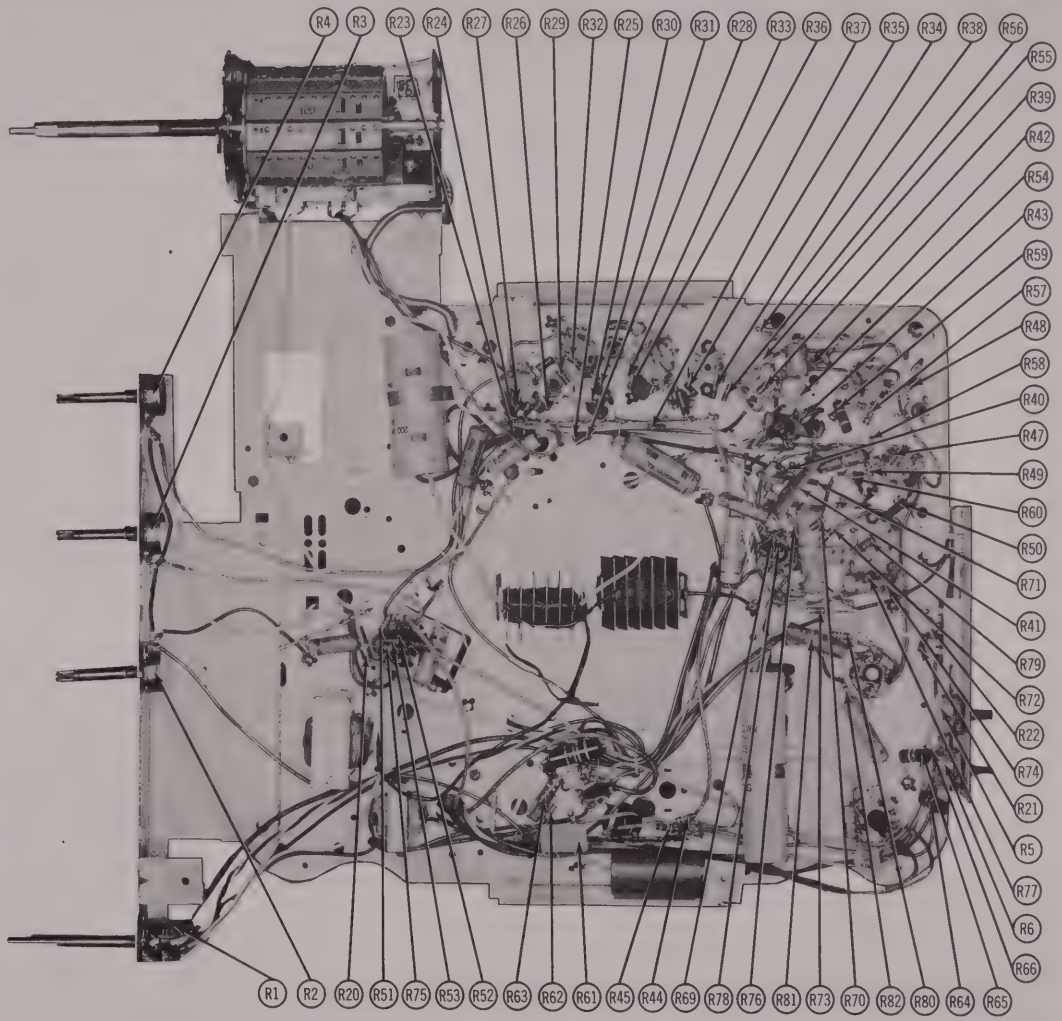


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

HALLICRAFTERS MODELS 21K3708, M, 21K3718, M, 21T3608, M, 21T3618, M, 24K3808, M, 24K3818, M, 24K4808, M, 24K4818, M (CH. A18000, B18000, C18000, D18000)



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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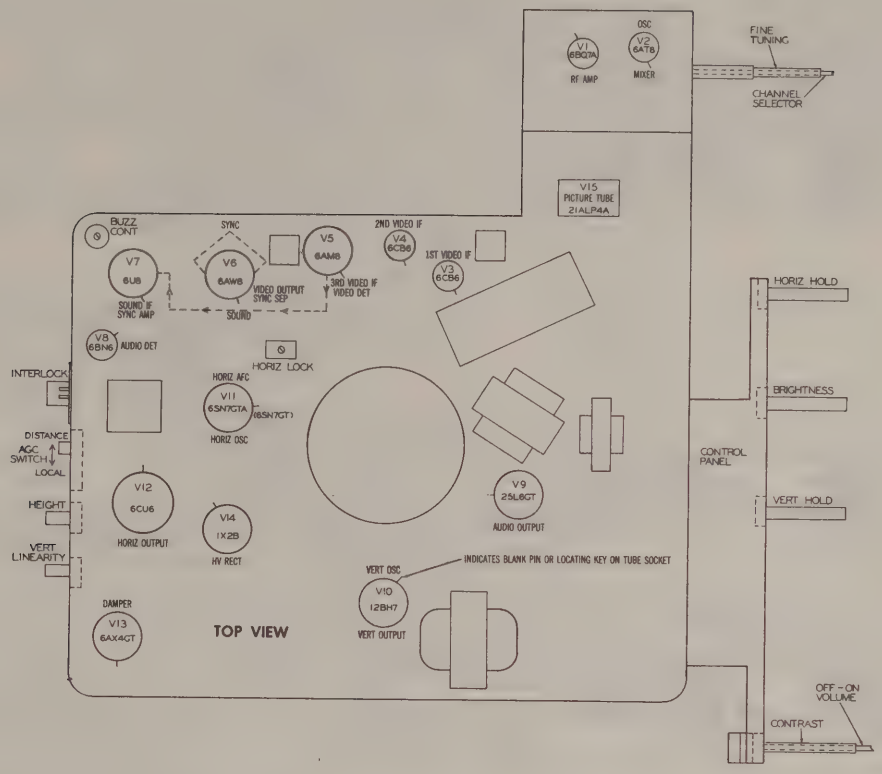
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V9**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V15**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V7, V10**
No horiz. sync - **V7, V11**
No vert. or horiz. sync - **V6, V7**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V15**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, M1, M2**
Vert. off freq. - **V7, V10**
Horiz. off freq. - **V7, V11**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage shock hazard may be eliminated by removing the 6AX4 (V13) damper tube and connecting a 2250Ω, 30 watt resistor from pin 5 of 6AX4 socket to chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C47. Connect the positive lead to chassis. Two peaks may occur during alignment of the video IF coils. Use the peak with the slug entering the coil from the end nearest the chassis.
The sound trap (A5) should be tuned with the slug entering the coil from the end away from the chassis.
Use only enough sweep generator output for useable pattern on scope. If sweep generator has no built-in marker, loosely couple a separate marker generator to sweep generator output.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to point Ⓑ. Low side to chassis.	44MC (10MC Swp.)	41.25MC 45.75MC	Between any two channels	Vert. Amp. thru detector probe (Fig.1) to pin 5 (plate) of first video IF Amp. tube (V3). Low side to chassis.	A1, A2	Adjust A1 and A2 for response curve similar to Fig. 2 with markers in proper position. Remove scope and detector from pin 5 of V3.
2.	"	"	"	41.25MC 42.5MC 45.75MC	"	Vert. Amp. thru 3.3KΩ to point Ⓐ. Low side to chassis.	A3, A4, A5, A6	Adjust for response curve similar to Fig. 3. Adjust A5 for MINIMUM amplitude at 41.25MC. A3 affects the high frequency end of the response curve and A4 affects the low frequency side. A6 affects center of response curve. Adjust A6 for maximum amplitude and MINIMUM tilt.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	.001MFD	High side to point Ⓐ. Low side to chassis.	Not used	4.5MC (400∿ Mod.)	Between any two channels	Vert. Amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Low side to chassis.	A7	Rotate contrast control fully clockwise. Adjust A8 completely out of coil. Then adjust A7 for MINIMUM 400∿ indication on scope.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Set volume control for normal volume.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.001MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (400∿ Mod.) (50KC Swp.)	4.5MC	Between any two channels	Across secondary of audio output transformer (T6).	A10	Set buzz control (R7) 90 degrees from maximum clockwise rotation. Adjust A10 for maximum 400∿ indication on cscope.
5.	"	"	"	"	"	"	A8, A9	Attenuate generator output so that signal level is below the limiting level of the 6BN6 as evidenced by background hiss and noise. Adjust A8 and A9 for maximum response on scope.
6.	"	"	Not used	4.5MC (400∿ Mod.)	"	"	R8	Use high signal generator output and adjust R7 for MINIMUM 400∿ indication on scope.
7.	"	"	4.5MC (400∿ Mod.) (50KC Swp.)	4.5MC	"	"	A10	With volume control at low level, retouch A10 for maximum 400∿ indication on scope. Remove test equipment. Connect antenna and tune in weakest station in that area and retouch A7 for MINIMUM buzz and hiss. Tune in strongest TV station in that area and adjust A10 for clearest sound.

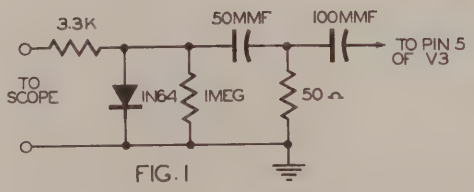


FIG. 1

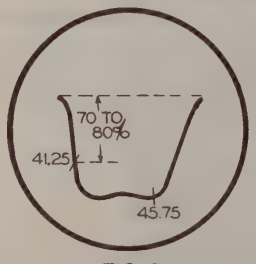


FIG. 2

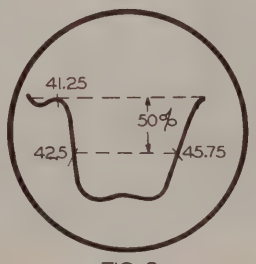


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNERS ID2207 AND ID2489

Leave the bias connected as under video IF alignment. Remove the 2250Ω resistor from the V13 socket (Pin 5 to chassis) and replace the 6AX4 in its socket.
The channel oscillator adjustment screws are reached through a hole just above the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp.)	211. 25MC 215. 75MC	13	Vert. Amp. thru 3.3KΩ to point (A). Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp.)	205. 25MC 209. 75MC	12		A12	
			201MC (10MC Swp.)	199. 25MC 203. 75MC	11		A13	
			195MC (10MC Swp.)	193. 25MC 197. 75MC	10		A14	
			189MC (10MC Swp.)	187. 25MC 191. 75MC	9		A15	
			183MC (10MC Swp.)	181. 25MC 185. 75MC	8		A16	
			177MC (10MC Swp.)	175. 25MC 179. 75MC	7		A17	
			85MC (10MC Swp.)	83. 25MC 87. 75MC	6		A18	
			79MC (10MC Swp.)	77. 25MC 81. 75MC	5		A19	
			69MC (10MC Swp.)	67. 25MC 71. 75MC	4		A20	
			63MC (10MC Swp.)	61. 25MC 65. 75MC	3		A21	
			57MC (10MC Swp.)	55. 25MC 59. 75MC	2		A22	

VHF RF AND MIXER ALIGNMENT FOR TUNERS ID2207 AND ID2489

The RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required in the field.

VHF TUNER ALIGNMENT FOR TUNER ID2209

The VHF tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF TUNER ALIGNMENT FOR TUNER ID2209

The UHF tuner portion of this receiver has been properly aligned at the factory is very stable. Alignment of this portion is not recommended in the field.

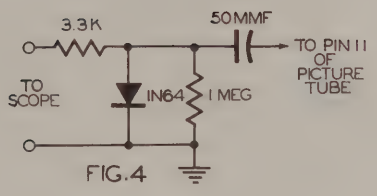


FIG. 4

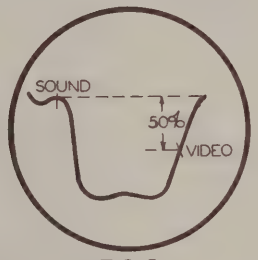
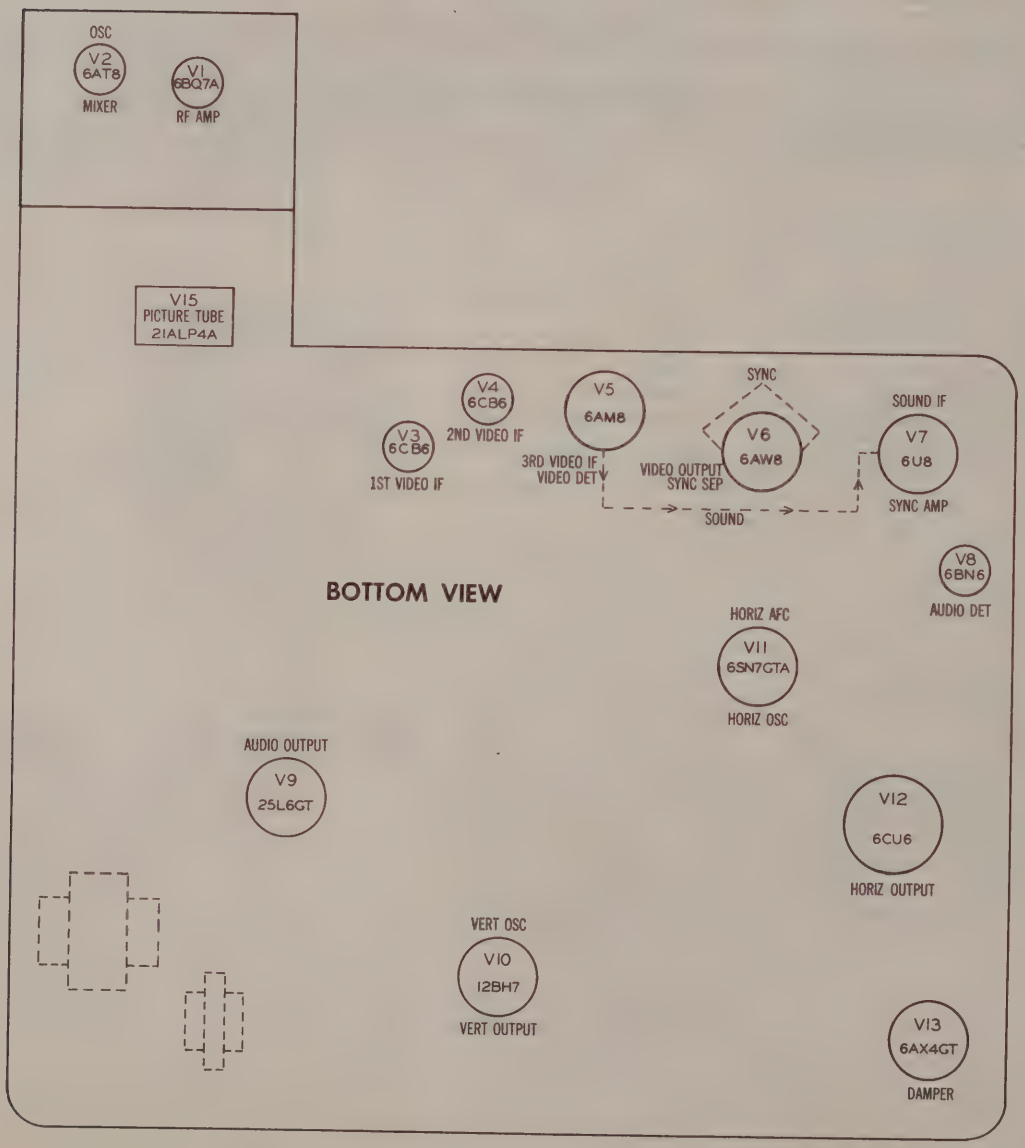


FIG. 5

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	2Meg	0Ω	0Ω	.1Ω	† 2.2KΩ	320KΩ	INF	320KΩ
V 2	6AT8	10KΩ	■ 4.1KΩ	0Ω	0Ω	.1Ω	■ 15KΩ	■ 47KΩ	0Ω	220KΩ
V 3	6CB6	1Meg	47Ω	.1Ω	0Ω	■ 1.2KΩ	■ 1.2KΩ	0Ω		
V 4	6CB6	1Meg	47Ω	.1Ω	0Ω	■ 1KΩ	■ 1KΩ	0Ω		
V 5	6AM8	180Ω	12KΩ	■ 1KΩ	.1Ω	0Ω	■ 1KΩ	.3Ω	5.6KΩ	0Ω
V 6	6AW8	0Ω	2.2Meg	■ 1Meg	0Ω	.1Ω	300Ω	1Meg	† 33KΩ	† 5.5KΩ
V 7	6U8	■ 11KΩ	2.9Ω	■ 18KΩ	0Ω	.1Ω	■ 18KΩ	150Ω	0Ω	47KΩ
V 8	6BN6	250Ω	3.8Ω	0Ω	.1Ω	■ 5.6KΩ	5.3Ω	† 330KΩ		
V 9	25L6GT	TP	0Ω	† 265Ω	† 53Ω	270KΩ	TP	1.5Ω	90KΩ	
V 10	12BH7	▲ 1.3KΩ	▲ 2.5Meg	7KΩ	.1Ω	.1Ω	▲ 2.5Meg	500KΩ	0Ω	0Ω
V 11	6SN7GTA	800KΩ	† 90KΩ	300KΩ	250KΩ	† 28KΩ	0Ω	0Ω	.1Ω	
V 12	6CU6	TP	0Ω	NC	† 12KΩ	390KΩ	NC	0Ω	0Ω	TOP CAP ▲ 24Ω
V 13	6AX4GT	NC	NC	850KΩ	NC	† 53Ω	NC	850KΩ	850KΩ	
V 14	1X2B		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 184Ω
V 15	21ALP4A	0Ω	0Ω	PIN 6 90KΩ	PIN 10 ▲ 390KΩ	PIN 11 ■ 350KΩ	PIN 12 .1Ω			

† MEASURED FROM OUTPUT OF M2.
■ MEASURED FROM 145V LINE.
▲ MEASURED FROM PIN 3 OF V13.
NC-NO CONNECTION.
TP-TIE POINT.



TUBE PLACEMENT CHART

ALTERNATE VHF-UHF TUNER SCHEMATIC
HALLICRAFTERS MODELS 21K370B, M, 21K371B, M, 21T360B, M, 21T361B, M, 24K380B, M, 24K381B, M, 24K480B, M, 24K481B, M (Ch. A1800D, B1800D, C1800D, D1800D)
UHF-VHF TUNER PART NO. 102209 USED WITH CHASSIS B1800D, AND D1800D
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
FINE TUNING
MIXER A 6U8
OSC B 6U8
RF AMP 6BZ7
UHF OSC 6AF4
UHF TUNER POWER SOCKET
UHF TUNER POWER PLUG
VHF ANT. TERM. BOARD
UHF ANT. TERM. BOARD
TEST POINT
TO JUNCT. OF R23 & C29
TO 145V LINE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	REPLACEMENT DATA: Hallicrafters Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	RF Amplifier	5DQ7A	5DQ7A	
V2	Mixer-Oscillator	6AT8	6AT8	
V3	1st. Video IF Amplifier	6CB6	6CB6	
V4	2nd. Video IF Amplifier	6CB6	6CB6	
V5	3rd. Video IF Amplifier - Video Detector	6AM8	6AM8	
V6	Video Output-Sync Separator	6AW8	6AW8	
V7	Sound IF Amplifier-Sync Amplifier	6U8	6U8	
V8	Audio Detector	6BN6	6BN6	
V9	Audio Output	25L6GT	25L6GT	
V10	Vert. Osc.-Vert. Output	12BH7	12BH7	
V11	Horiz. AFC-Horiz. Osc.	6GN7GTA	6GN7GTA	SENTGT may be used as an alternate
V12	Horiz. Output	6CU6	6CU6	
V13	Damper	6AX4GT	6AX4GT	
V14	HV Rectifier	1X2B	1X2B	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: CBS Part No.	REPLACEMENT DATA: GENERAL ELECTRIC Part No.	REPLACEMENT DATA: SYLVANIA Part No.	NOTES
V15	21ALP4A ①	21ALP4A①	21ALP4A / B ⑤	① Aluminized ② Silver screen
		21ALP4AⓇ		
		21ALP4		
	24CP4A①	24CP4A ①	24CP4A ②	
			24CP4	
	24DP4A ①	24DP4A ①	24DP4A ②	
			24D24	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Hallicrafters Part No.	AEROVOX Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	SPRAGUE Part No.
C1	200	150	45A209	PRS-100	EZ10400	WS342	TD-200-300	S-110	R1646
C2A	140	300	45A208		EZ10401	WQ606	CDB-1006	Q-163	TVA-1651
B	300	150						FM-4540	TVA-1611
C	5	300							
D	50	150							
C3A	200	150	45B312	AFBR2-109	EZ10399	WD346	TDL-305	D-088	TVL-3444
B	5	150							
C4	20	450	45B208	PRS450V20	BR2045	TC75	TD-20-450	FM-4520	TVA-1709

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Hallicrafters Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C8	470	500	47XZ0B471M	SZ470	D5-471	SWST47	GPBK-471	MC345	1FM-347	
C6	470	500	47XZ0B471M	SZ470	D5-471	SWST47	GPBK-471	MC345	1FM-347	
C7	5			NPO-D15	TCZ-4R7	20U	NPOA-050	ZT-555	5TCCB-V47	
C9	120			BPD-00012	DD-121	C044	81J-121	UC-5313	5GA-T12	
C10	6.8			NPO-D18.8	TCZ-6R8	Z013	NPOA-6R8	ZT-5568	5TCCB-V68	
C11	6.8			NPO-D18.8	TCZ-6R8	Z013	NPOA-6R8	ZT-5568	5TCCB-V68	
C11	.5-3				829-3		31J5-01-0R5	CT565A		
C13	800			NPO-SZ1.2	TCZ-2R3	TZ05	NPOA-2R3		5TCCB-V23	
C13	3.2									
C14	800				829-3		31J5-01-0R5	CT565A		
C15	.5-3									
C16	800				829-3		31J5-01-0R5	CT565A		
C17	.5-3									
C18	800			NPO-D10	TCZ-10	Z018	NPOA-100	ZT-541	5TCC-Q1	
C20	1.5			NPO-S11.5	TCZ-1R5	TZ04	NPOA-1R5	ZT-5515	5TCCB-V15	
C21	10									
C22	8									
C23	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C24	43				TCZ-43	Z025	NP0L-430			
C25	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C26	800									
C27	800									
C28	.05	200	45A1503J	BPD-05	DF-503	CUBS25		PT415	2TM-S5	
C29	.05	200	45A1503J	BPD-05	DF-503	CUBS25		PT415	2TM-S5	
C30	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C31	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C33	24		47CA30A240J	SZ24	TCZ-240	Z025	GPJK-240	UC-5428	5GA-Q25	
C33	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C34	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C35	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	39			NPO-SZ39	TCZ-39J	Z021	NP0L-390		5TCC-Q39	
C37	24		47CA2A240J	SZ24		Z025	GPJK-240	UC-5428	5GA-Q25	
C38	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C40	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C41	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	10		47CA30J10P	SZ10	TCZ-10	Z018	GPJK-100	UC-541	5GA-Q1	
C43	4.7		47A150-S	NPO-SZ4.7	TCZ-4R7	TZ07	NP0A-4R7	ZT-5567	5TCCB-V47	
C44	56		47D478							
C45	15		47A478							
C46	4.7			NP0-SZ4.7	TCZ-4R7	TZ07	NP0A-4R7	ZT-5567	5TCCB-V47	
C47	.25	300	46A243	P25N-25		CUB3P25		PT405	2TM-P25	
C48	1	150	46A243	P25N-1	DF-104	CUB2P1		PT401	2TM-P1	
C49	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C50	.1	400	46A1004J	P4N10-1	DF-104	CUP4D1		PT401	4TM-P1	
C51	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C52	33		47A478							
C53	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C54	.01	200	46A1003J	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C55	15		47D400							
C56	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C57	.02	200	46A2203J	BPD-02	DD-203	CUB2S2	81T-S2	PT412	2TM-S2	
C58	.02	600	46A2203J	BPD-02	DD-203	CUB6S2	81T-02	PT612	6TM-S2	
C59A	270					TP4I	GPJK-271	UC-5327	5GA-T27	
B	10000		†48A046	†PA-S53	†PC-283	K062	81S-01	DC-511	5HK-S1	
C	25					TP25	GPJK-250	UC-5425	5GA-Q25	
C60	.05	200	46A1503J	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C61	33		47CA30A330M	SI330	D5-330	TP2T	GPJK-330	UC-5433	5GA-Q33	
C62A	4700		†48A044	†PA-S83-2	†PC-106	K079	81J-0047	DC-525	†101C12	
B	4700					K079	81J-0047	DC-525		

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Hallicrafters Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C63	.01	400	46SR103Z4	SZP-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C64	470		47CA3047IK	SI470	D5-471	TP4S	GPBK-471	UC-5847	5GA-T47	
C65	.047	400	46SR473Z4							
C66	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C67	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C69	20		47CA20300K	SI20	D6-300	G023	GPJK-300	ZT-543	5GA-Q2	
C69	.05	400	46AW503J	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C70	.03	200	46AU303J	BPD-03	DD-303	CUB2S3	81T-03	PT413	2TM-S3	
C71	.35	300	46A342	P2S5N-35		CUB2P35		PT4035	2TM-P35	
C72	33		47A478							
C73	220	500	47X20B221K	1469-00022	D6-221	5RST22	81J-221	MC B240	MS-322	
C74	.01	400	46C344							
C75	30000			BPD-03	DD-303	KD85	81T-03	PT613	6HK-S3	Note 1
C76	1000	500	47X30B132K	1464-0013		DF-503	1R5D13		MS-213	
C77	.05	400	46AW503J	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C78	1000		47A230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C79	47	3000			HVD-30-47	DD30-470	V3G43	3KV-470	30GAB-Q47	Note 3
C80	.08	300	46AU803J							
C81	8	3000								Note 3
C82	5000	1000	47A485		HVD-15-4700	DD-502	VD47	1R5KV-472	10HK-D47	

Note 1. Some versions use a .023MFD in this application (part #46BR23364).
Note 2. Some versions use a 56MMF in this application (part #47A555).
Note 3. Some versions use a 88MMF in this application.
† Items C58A, C59B, C59C, R55A and R55B are combined in one unit.
* Items C58A, C62B, R61A and R61B are combined in one unit.

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Hallicrafters Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	150Ω	½	25B147	F1-7		QJ-574 ▲	UF152R	Contrast (Panel)
B	250KΩ	½		RS-41			UR354A]**	Volume (Rear)
C	Switch			KB-1			US-26)	Attach to R1B.
R2A	1.5Meg	½	25B180	AB-96 *	A47-1Meg-B*	Q11-137 *	Not Req.	Vertical Hold-Note 1
B	Shaft		Not Req.	AK-4	RS2-3	Not Req.	Not Req.	Attach to R2A.
R3A	5Meg	½	25B148			Q17-141		Brightness
B	Shaft		Not Req.			Not Req.		Attach to R3A.
R4A	165KΩ	½	25B146	AB-35 †	A47-75K-S †	Q11-135 †		Horiz. Hold-Stop at 75KΩ
B	Shaft		Not Req.	AK-4	KS3-3			Attach to R4A.
R5A	1Meg	½	25B109	AB-98 *	A47-1Meg-B*	Q11-141 *	TAP3551. *	Height -Stop at 4Meg
B	Shaft		Not Req.	AK-19	RN-3	TQ	Not Req.	Attach to R5A.
R6A	750Ω	½	25B109	AB-5	A47-750-S	Q11-105	TAP781.	Vertical Linearity
B	Shaft		Not Req.	AK-19	RN-3	TQ	Not Req.	Attach to R6A.
R7	500Ω	2	25A106		39-500			Buzz (Wire Wound)

Note 1. Stop at 500KΩ, Part No. 25B117 used in some versions.
* Connect a 470KΩ resistor in series with the left hand terminal of the control, and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
† Connect a 68KΩ resistor in series with the right hand terminal of the control, and the lead connecting to the same terminal of the original control (control viewed from shaft end , terminals down).
‡ Connect a 1Meg resistor in series with the right hand terminal of the control, and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
▲ Concentrikit Equivalent: K-7 Kit, Base Elements and Shafts: B17-109, P17-314 (Panel)
B13-132, R1-300 (Rear)
76-1 (Switch)
** Universal Replacement (Mallory Exact Duplicate Part No UE-1688).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Hallicrafters Part No.	IRC Part No.	NOTES
R8	470Ω	1	23XZ0X474K	BTS-470K	
R9	470KΩ	½	23XZ0X474K	BTS-470K	
R10	680KΩ	½			
R11	4700Ω	½			
R12	820KΩ	½			
R13	470KΩ	½			
R14	10KΩ	½			
R15	3300Ω	½			
R16	10KΩ	½			
R17	220KΩ	½			
R18	150KΩ	½			
R19	47KΩ	½			
R20	2200Ω	1	23XZ0X222K	BTS-47K	
R21	1Meg	½	23XZ0X105K	BTS-1Meg	
R22	330KΩ	½	23XZ0X334K	BTS-330K	
R23	1Meg	½	23XZ0X105K	BTS-1Meg	
R24	47050 5%	½	23XZ0X473K		
R25	47000Ω	½	23XZ0X473K	BTS-4700	
R26	100KΩ	½	23XZ0X104K	BTS-100K	
R27	47Ω	½	23XZ0X470K	BTS-47	
R28	22KΩ	½	23XZ0X223K	BTS-220	
R29	18KΩ	½	23XZ0X183K		
R30	1000Ω	½	23XZ0X102K	BTS-1000	
R31	1000Ω	½	23XZ0X102K	BTS-1000	
R32	47Ω	½	23XZ0X470K	BTS-47	
R33	12KΩ	½	23XZ0X123K		
R34	1000Ω	½	23XZ0X102K	BTS-1000	
R35	1000Ω	½	23XZ0X102K	BTS-1000	
R36	180Ω	½	23XZ0X181K	BTS-180	
R37	1Meg	½	23XZ0X105K	BTS-1Meg	
R38	5600Ω	½	23XZ0X562K	BTS-5600	
R39	1Meg	½	23XZ0X105K	BTS-1Meg	
R40	18KΩ	½		BTS-18K	
R41	5500Ω	½			
R42	18KΩ	1		BTA-18K	
R43	33KΩ	2	23XZ0X333K	BTS-33K	
R44	390KΩ	½	23XZ0X394K	BTS-390K	
R45	820KΩ	½	23XZ0X824K	BTS-820K	
R46	100KΩ	½	23XZ0X104K	BTS-100K	
R47	18KΩ	½	23XZ0X183K	BTS-18K	
R48	150Ω	½	23XZ0X151K	BTS-150	
R49	470Ω	1	23XZ0X471K	BTS-470	
R50	5600Ω	1	23XZ0X562K	BTA-5600	
R51	5600Ω 5%	½	23XZ0X564J	BTS-5600 5%	
R52	8200Ω	½	23XZ0X822K	BTS-8200	
R53	470KΩ 5%	½	23XZ0X474J	BTS-470K 5%	
R54	15KΩ	½	23XZ0X153K	BTS-15K	
R55A	220KΩ		† 49A046	BTS-220K	
B	2.2Meg			BTS-2.2Meg	
R56	1Meg	½	23XZ0X105K	BTS-1Meg	
R57	47KΩ	½	23XZ0X473K	BTS-47K	
R58	680KΩ	½	23XZ0X684K	BTS-680K	
R59	8800Ω	½	23XZ0X882K	BTA-8800	
R60	47000 5%	½	23XZ0X472K	BTS-47000 5%	
R61A	1Meg	½	▼ 49A044	BTS-22K	
B	10KΩ			BTS-10K	
R62	2.2Meg	1		BTS-2.2Meg	Note 1
R63	680KΩ	1	23XZ0X684K	BTA-680K	
R64	15KΩ	2	23X40X153K	BTS-15K	
R65	15KΩ	2	23X40X153K	BTS-15K	
R66	68KΩ	½	23XZ0X683K	BTS-68K	
R67	180Ω	½			Note 2
R68	560Ω	½			
R69	560KΩ	1	23XZ0X564K		
R70	150KΩ	1	23XZ0X154K		
R71	150KΩ	1	23XZ0X154K		
R72	100KΩ	1	23XZ0X104K		
R73	1000Ω	1	23XZ0X102K	BTS-1000	
R74	27KΩ	1	23XZ0X275K	BTS-27K	
R75	100KΩ	1	23XZ0X104K		
R76	8200Ω	1	23XZ0X822K	BTS-8200	
R77	180KΩ	½	23XZ0X184K		
R78	2.7Meg	½	23XZ0X275K		
R79	18KΩ	½	23XZ0X183K		
R80	390KΩ	½	23XZ0X394K		
R81	12KΩ	2	23A097		
R82	100Ω	½	23XZ0X101K	BTS-100	
R83	47000Ω	½	23XZ0X472K		
R84	2.2Ω	½		BWJ-2.2	
R85	7.3Ω	½	23B101		
R86	33KΩ	1	23XZ0X333K	BTA-33K	

Note L Not used in some versions.
Note 2. Some versions use a 5601 ½W resistor in this application.
† Items R55A, R55B, C59A, C59B, C59C are combined in one unit.
▼ Items R61A, R61B, C62A, C62B are combined in one unit.

TRANSFORMER (FILAMENT)

ITEM No	RATING	REPLACEMENT DATA: Hallicrafters Part No	Halldorson Part No	Merit Part No	Stancor Part No	Thordarson Part No	Triad Part No	NOTES
T1	117VAC 6.3V @ .58A @ 1.2A; Tap @ 25V @ .3A; Tap @ 6.3V @ 6.2A	53C322				35F64		

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Hallicrafters Part No	Halldorson Part No	Merit Part No	RCA TYPE No	Stancor Part No	Thordarson Part No	Triad Part No
T2	Vert. Osc. Trans.	55B250	BT504	A-3008				
T3	Horiz. Output Trans	55D273	FB418 *	HVO- 37 *		X123 *	A-8283 *	FLY-25 * D-48 *
T4	Vert. Output Trans.	55C280	Z1807	A-2824				
T5A	Yoke(90°)Horiz. (30MH)	53D354]	DF607	MDF-92	235D1	Y90F19/43	DY-15A	Y-16 Y-61-1
B	Vert. (31MH)		③③③	③③③	③③③	③③③	③③③	③③③

[Does not include deflection yoke spacer bracket (Hallicrafters Part No 67B2408).
③ Use original rear cover and centering device.
④ Use original yoke damping network.
⑤ Jumper terminals #1, #5, and #8.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	6	6		3	6	6	6
5	3	3		7	3	3	3
2	8	8		3	8	8	8
6	2	2	6	2	2	2	2

TRANSFORMER (AUDIO OUTPUT)

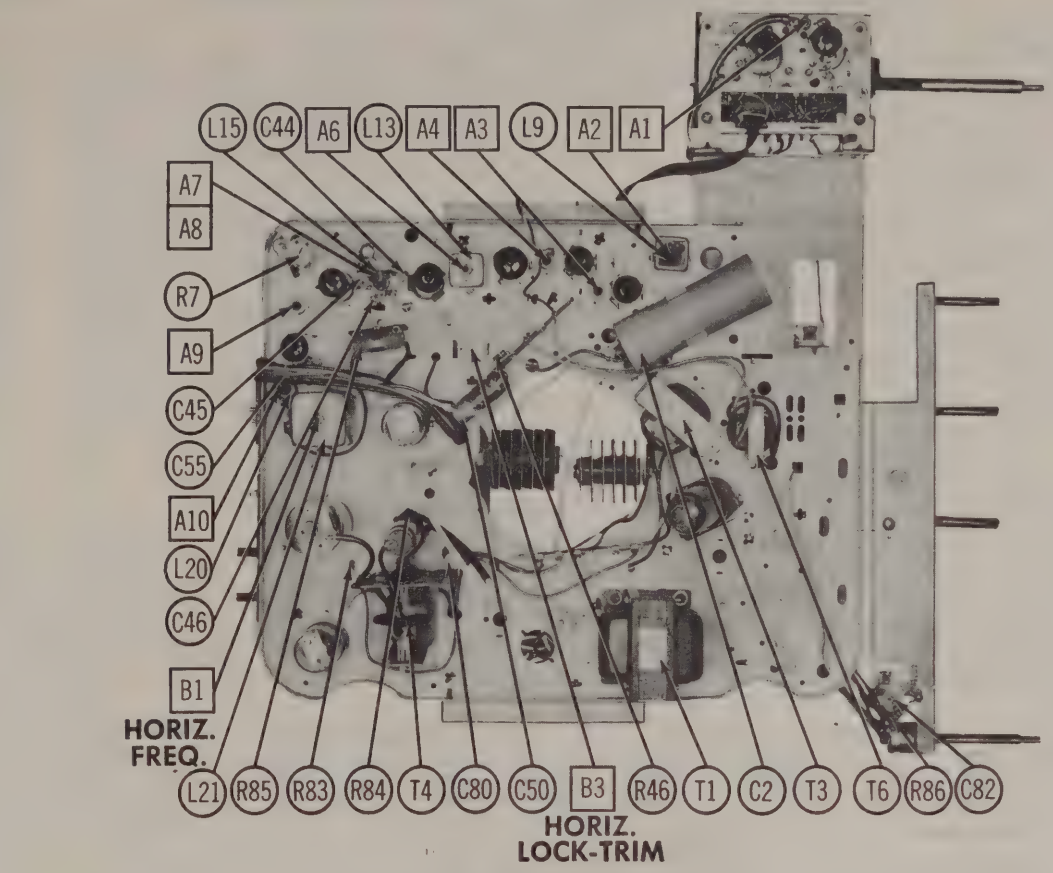
ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: Hallicrafters Part No	Halldorson Part No	Merit Part No	Stancor Part No	Thordarson Part No	Triad Part No	NOTES
T6	2.2KΩ	3.3Ω	55B248	ZU00	A3025	A3332	24S50	S-12X	

SPEAKER

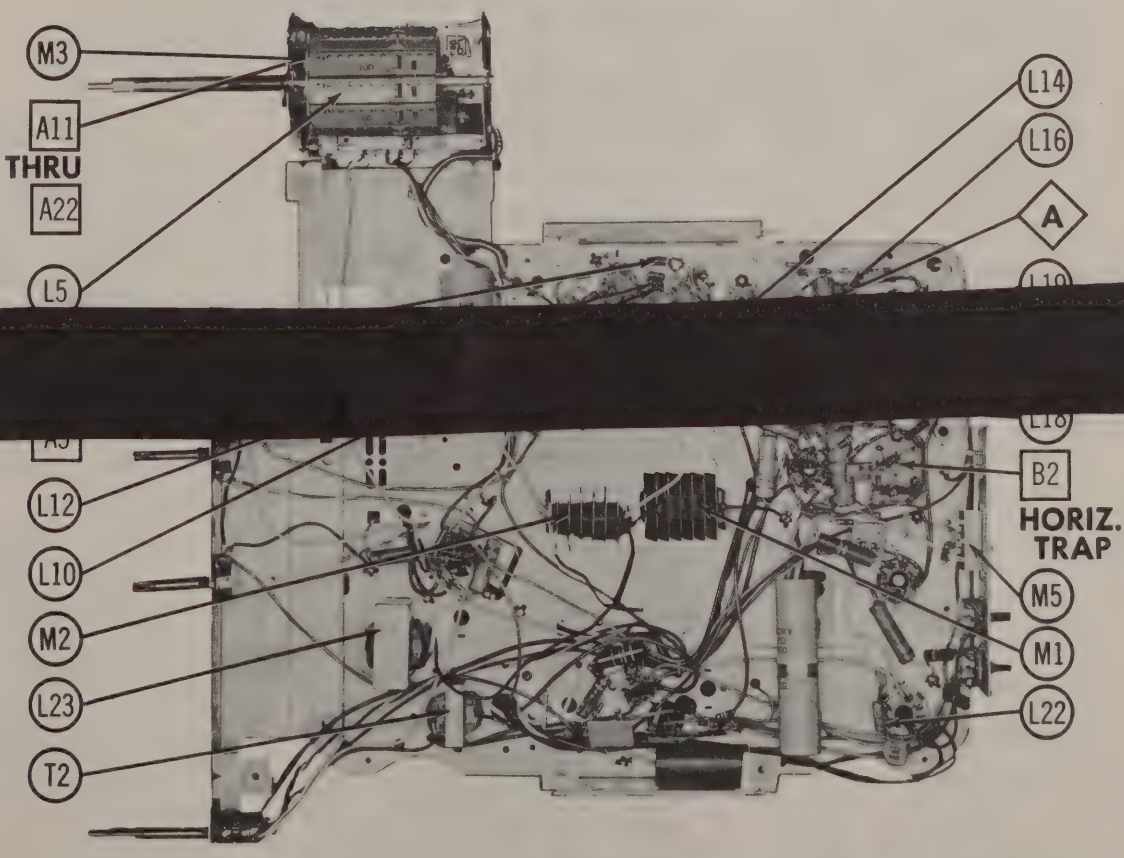
ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP	REPLACEMENT DATA: Hallicrafters Part No.	QUAM Part No.	RCA TYPE No	NOTES
SP1	4"	PM	3.3Ω	85C175A	4A07 ①	223S1	① Used in Models 21T360M, 21T360B, 21T361M, 21T361B, 24K480M, 24K480B, 24K481M, 24K481B
	8"	PM			6A15 ②	224S1	② Used in Models 24K380M, 24K380B, 24K381M, 24K381B, 24K481M, 24K481B
	8"	PM			8A21 ③	203S3	

COILS (RF-IF)

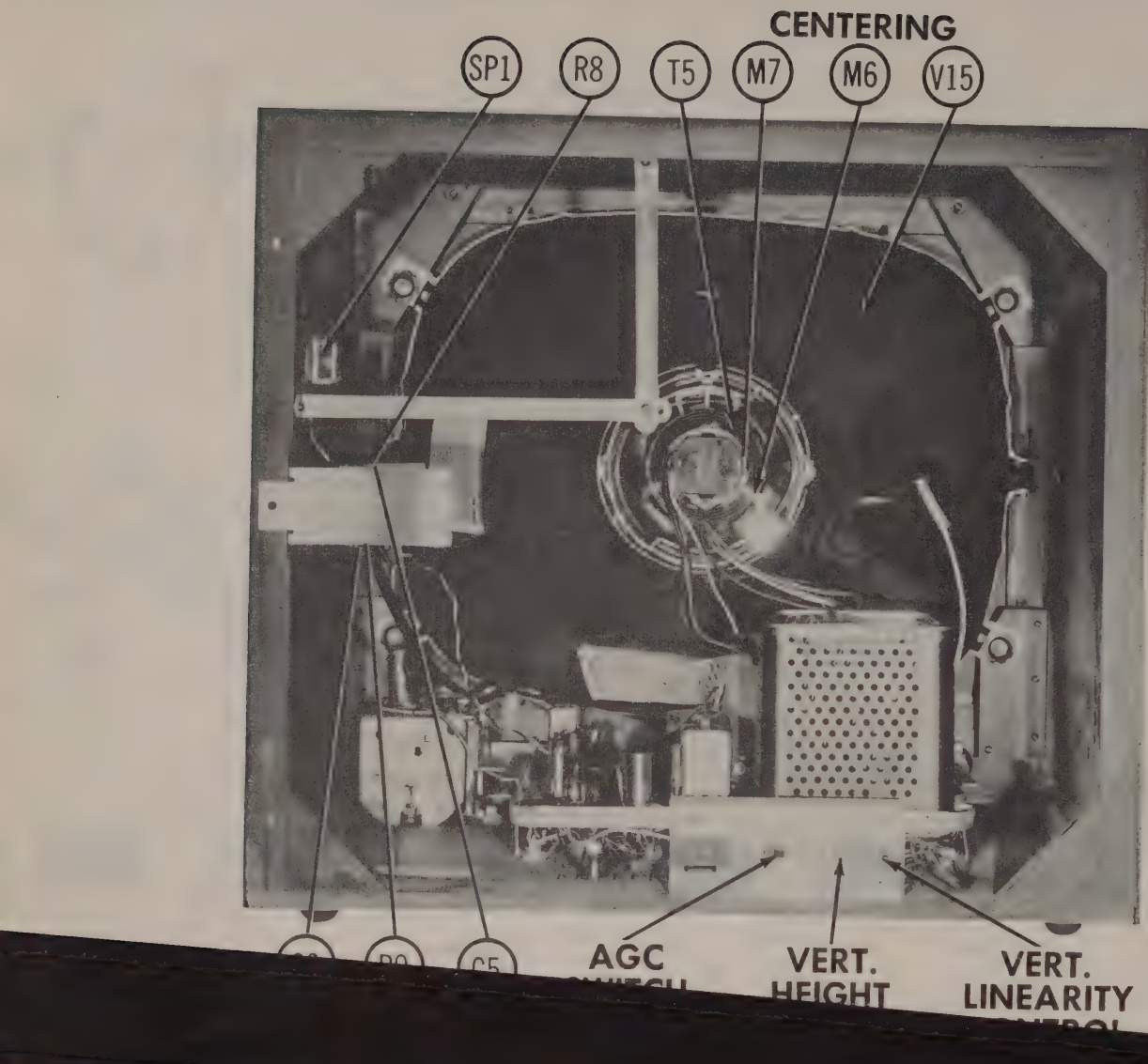
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Hallicrafters Part No	MEISSNER Part No	MERIT Part No	MILLER Part No	NOTES
L1	Ant. Matching Trans.	0Ω	0Ω					
L2	Ant Matching Trans.	0Ω	0Ω					
L3	RF Trap	1Ω						
L4	FM Trap	0Ω						
L5A	Ant. RF, Mixer Grid, Osc. Coils	0Ω		121-1010				Channel 2
B	Ant., RF, Mixer Grid, Osc. Coils	0Ω		121-1011				Channel 3
C	Ant., RF, Mixer Grid, Osc. Coils	0Ω		121-1012				Channel 4
D	Ant., RF, Mixer Grid, Osc. Coils	0Ω		121-1013				Channel 5
E	Ant., RF, Mixer Grid, Osc. Coils	0Ω		121-1014				Channel 6
F	Ant., RF, Mixer Grid, Osc. Coils	0Ω		121-1015				Channel 7
G	Ant. RF, Mixer Grid, Osc. Coils	0Ω		121-1016				Channel 8
H	Ant., RF, Mixer Grid, Osc. Coils	0Ω		121-1017				Channel 9
I	Ant., RF, Mixer Grid, Osc. Coils	0Ω		121-1018				Channel 10
J	Ant., RF, Mixer Grid, Osc. Coils	0Ω		121-1019				Channel 11
K	Ant., RF, Mixer Grid, Osc. Coils	0Ω		121-1020				Channel 12
L	Ant., RF, Mixer Grid, Osc. Coils	0Ω		121-1021				Channel 13
L6	Neut. Coil	0Ω						
L7	RF Coil	0Ω						
L8	Conv. Plate	.1Ω						
L9	Ist. Video IF	.3Ω		51A1926	17-4504*	TV-125m	6234m	
L10	2nd Video IF	.1Ω		51A1925	17-4501*	TV-130m	6225	
L11	Fil. Choke	0Ω		53A282	19-3901		6175	4 Microhenries



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENT.



HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

1. Preset the horizontal lock trimmer (B3) one half turn from maximum clockwise position.

2. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

3. Connect the vertical amplifier of the oscilloscope thru a 10MMF capacitor to lug "4" of the horizontal oscillator transformer (L22). Connect the low side to chassis. Adjust the horizontal waveform slug (B2) until waveform similar to Fig. 6 is obtained on the scope. While making this adjustment keep the picture in sync with the horizontal hold and if necessary, B1 and B3.

4. Remove scope from lug "4" of L22. Turn the horizontal hold control fully counter clockwise until the picture just looses sync, then turn B1 clockwise until picture is just ready to pull-in sync.

5. Turn the horizontal hold control fully clockwise. Picture should remain in sync. Momentarily remove signal by switching off channel and back again. Turn the horizontal hold control counter clockwise slowly until the picture just falls into sync. If more than three bars are present just before picture falls into sync, adjust the horizontal lock trimmer (B3) slightly clockwise. If less than three bars are present, adjust B3 slightly counter clockwise. Repeat steps 4 and 5 until the effective pull-in range of the horizontal hold control is from 60 to 120 degrees.

6. In weak signal areas, adjust the horizontal hold control so that when switching off channel and back again, the picture returns completely in sync.

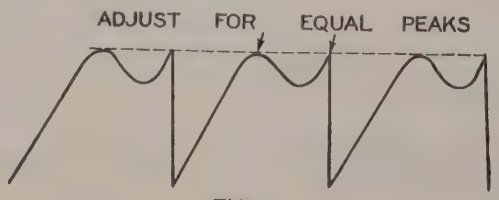


FIG. 6

MOTOROLA MODELS
56X1, 56X2, 56X3, (Ch. HS-477)

MOTOROLA MODELS
56X1, 56X2, 56X3, (Ch. HS-477)

TRADE NAME	Motorola Models 56X1, 56X2, 56X3 (Ch. HS-477).
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver.
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier.
POWER SUPPLY	110-120 Volts AC-DC
RATING	.24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	530-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400~ mod)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop (radiated).	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

MOTOROLA
Model 56X1

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT	
V1	Converter	12BE6	12BE6	
V2	IF Amplifier	12BA6	12BA6	
V3	Det.-AVC-AF Amplifier	12AV6	12AV6	
V4	Output	50C5	50C5	
V5	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	23B634167	PRS150V40-30-20	BBRT44215	TCT3116	TDL-404020-150	FMT-315	TVA-3451
B	30	150							
C	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100		21R400537	BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1	
C3	.05	200	8R121005	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C4	.006	400	8R121001	SI6000		CUB6D6	GP3-333-602	PT626	6TM-D6	
C5	.006	400	8R121001	SI6000		CUB6D6	GP3-333-602	PT626	6TM-D6	
C6	100		21R400537	BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1	
C7	.01	200	8R121868	BPD-01	DD-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C8	10000		21R121946	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C9	.047	400	8K490232	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C10	.1	600	8R121869	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	18A634110	ABT-73	A47F1-1Meg	Q13-137X	UT-438	Volume
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A

RESISTORS

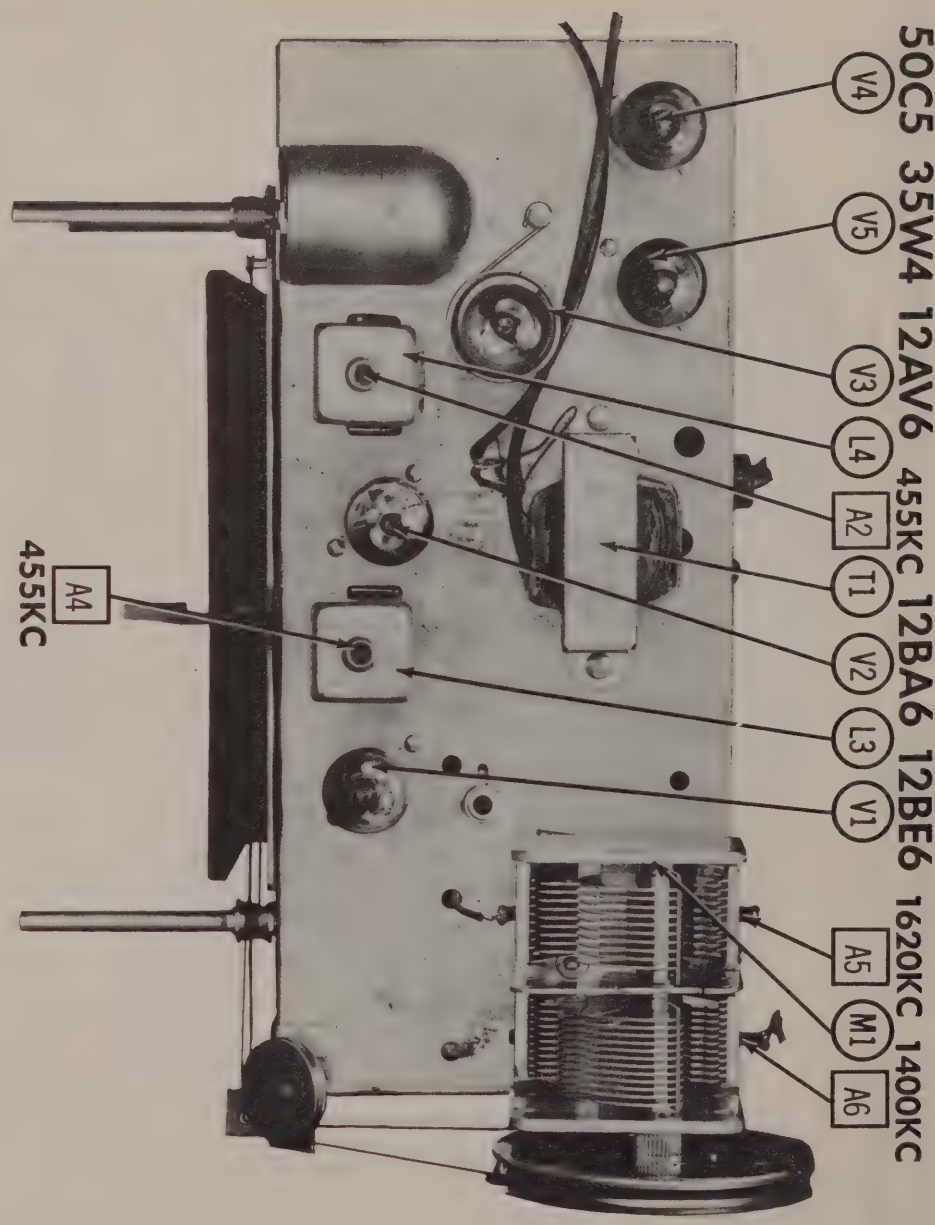
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	470KΩ	½	6R6032	BTS-470K	
R3	22KΩ	½	6R6028	BTS-22K	
R4	2.2Meg	½	6R3927	BTS-2.2Meg	
R5	82Ω	½	6R2035	BTS-82	
R6	39KΩ	½	6R6487	BTS-39K	
R7	10Meg	½	6R2109	BTS-10Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R8	470KΩ	½	6R6032	BTS-470K	
R9	470KΩ	½	6R6032	BTS-470K	
R10	150Ω	½	6R6373	BTS-150	
R11	390Ω	1	6R5598	BTA-390	
R12	390Ω	1	6R5598	BTA-390	
R13	15Ω	½	6R2034	BTS-15	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.65KΩ	3-4Ω	25C634161-A	Z1001	A-3025	A-3876	24S45	S-1X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

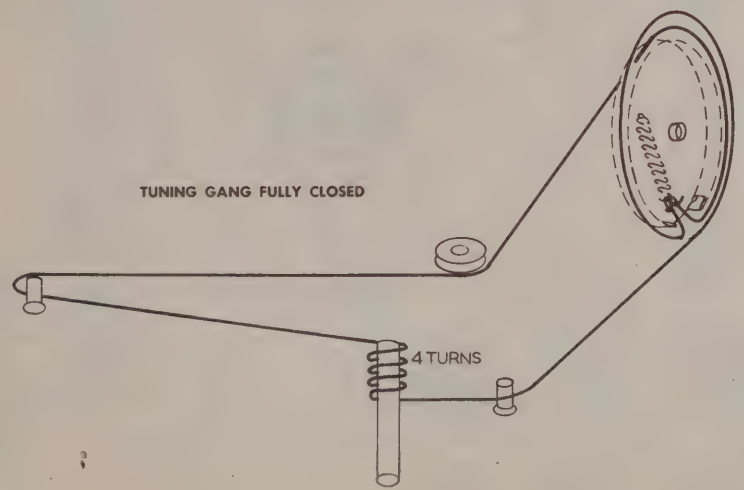
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	50K634456	4A07 ①	22381 ①	① Trim corners to match original

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.4Ω		24K634200				Includes cabinet back
L2	Osc. Coil	.8Ω	9.7Ω	24B634118			69-OSC	
L3	Input IF	16Ω	16Ω	24C632774	16-6758	BC-352	12-C1	
L4	Output IF	15Ω	15Ω	24K632775	16-6770	BC-355	12-C6	

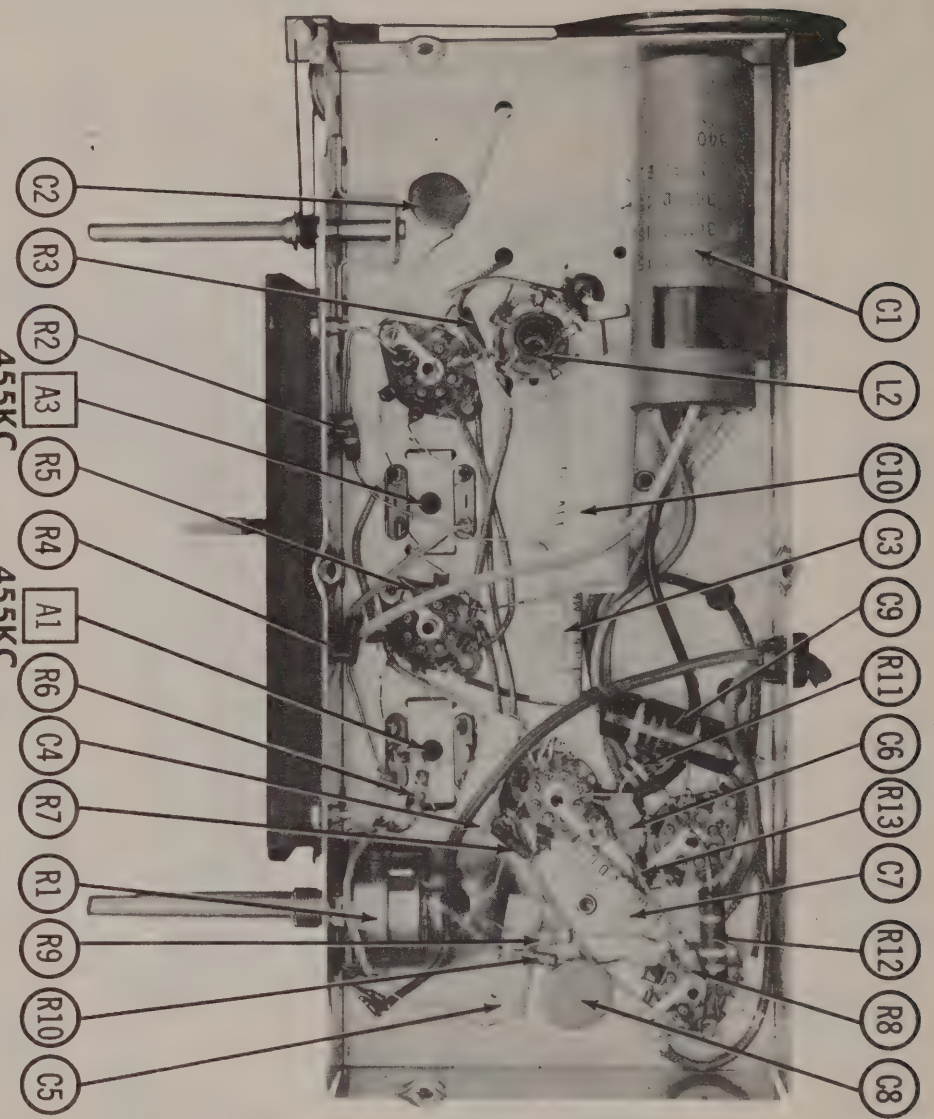
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Tuning Cap.	19B634158	2 Gang (16-390MMF, 24-145MMF)
	Cabinet	1V634338	Model 56X1
	Cabinet	1V634386	Model 56X2
	Cabinet	1V634394	Model 56X3
	Knob	36D634193	Tuning
	Knob	36K634195	On-off-volume
	Dial Scale	61K634103	

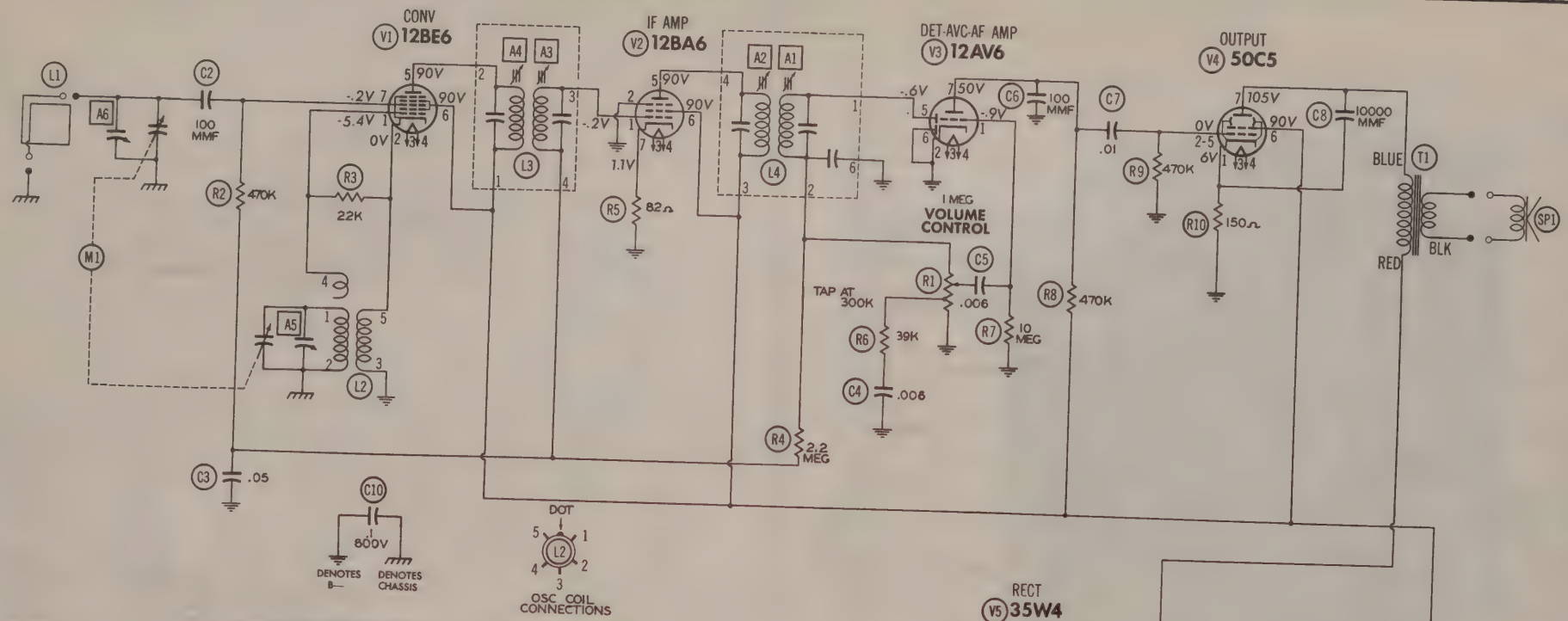


DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



MOTOROLA Model 56X1



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1Ω	12Ω	24Ω	† 800Ω	† 800Ω	3.7Meg
V 2	12BA6	3.2Meg	0Ω	24Ω	36Ω	† 800Ω	† 800Ω	82Ω
V 3	12AV6	10Meg	0Ω	12Ω	0Ω	1Meg	0Ω	† 470KΩ
V 4	50C5	150Ω	470KΩ	86Ω	36Ω	470KΩ	† 800Ω	† 130Ω
V 5	35W4	TP	TP	86Ω	120Ω	120Ω	115Ω	50KΩ

† MEASURED FROM PIN 7 OF V5.
TP TIE POINT.

IF = 455KC

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PACKARD-BELL MODELS 21DC1, -U, 21DC2, -U, 21DD1, -U, 21DT1, -U, 24DC1, -U, 24DD1, -U, 24DT1, -U (Ch. 98D1)

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PACKARD-BELL MODEL 21DT1

TRADE NAME	Packard-Bell	MODELS	CHASSIS
		21DC1, 21DC1-U, 21DC2, 21DC2-U, 21DD1, 21DD1-U, 21DT1, 21DT1-U, 24DC1, 24DC1-U, 24DD1, 24DD1-U, 24DT1, 24DT1-U	98D1
MANUFACTURER	Packard-Bell Co.-Service Division, 11th. & Hope Sts., Los Angeles 15, California		
TYPE SET	Television Receiver		
TUBES	Nineteen		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 1.66 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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PACKARD-BELL MODELS 21DC1, -U, 21DC2, -U, 21DD1, -U, 21DT1, -U, 24DC1, -U, 24DD1, -U, 24DT1, -U (Ch. 98D1)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 push-on type control knobs from front panel of cabinet.
2. Remove 5 wood screws and 1 metal screw. Remove rear cover.
3. Disconnect speaker plug.
4. Remove 3 chassis bolts. Remove chassis.
5. Remove 4 speaker nuts. Remove speaker.

MODEL	CHASSIS
21DC1, 21DC1-U, 21DC2, 21DC2-U, 21DD1, 21DD1-U, 21DT1, 21DT1-U, 24DC1, 24DC1-U, 24DD1, 24DD1-U, 24DT1, 24DT1-U	98D1

PACKARD-BELL MODELS 21DC1, -U, 21DC2, -U, 21DD1, -U, 21DT1, -U, 24DC1, -U, 24DD1, -U, 24DT1, -U (Ch. 98D1)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the hole in the cabinet above the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws holding metal strip at the top edge of the safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See Tube Placement Chart on Page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator may be made from the front panel of the chassis. Adjust the horizontal hold control until the picture synchronizes horizontally. Switch off channel and back again. If picture loses sync, slightly retouch horizontal hold control.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L21) located on top of the chassis.

FUSES

One fuse is used for Horiz. Sweep Circuit protection. (For location see Tube Placement Chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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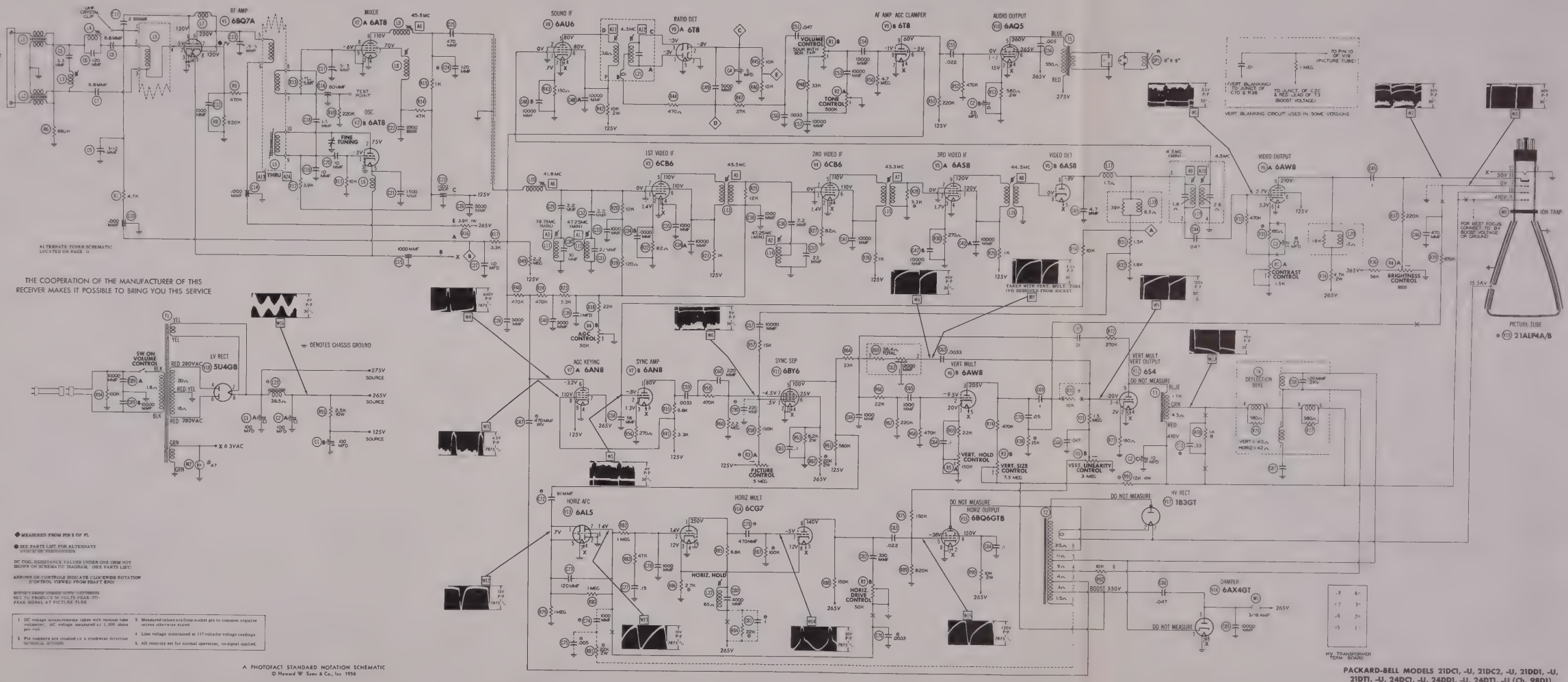


PACKARD-BELL MODELS 21DC1, -U, 21DC2, -U, 21DD1, -U, 21DT1, -U, 24DC1, -U, 24DD1, -U, 24DT1, -U (Ch. 98D1)

PACKARD-BELL MODELS 21DC1, -U, 21DC2, -U, 21DD1, -U, 21DT1, -U, 24DC1, -U, 24DD1, -U, 24DT1, -U (Ch. 98D1)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L11	39.75MC Trap	0Ω		29565A	20-1046		6225	
L12	47.25MC Trap	0ΩCT		29564A				
L13	2nd Video IF	.1Ω	.1Ω	29585	17-4523	TV-130	6219	
L14	47.25MC Trap	0ΩCT		29564A				
L15	3rd Video IF	.1Ω	.1Ω	29586A	17-4524	TV-130	6219	
L16	4th Video IF	.1Ω	.1Ω	29587	17-4522	TV-130	6219	
L17	Series Peaking Coil	1.7Ω		29566	19-1005		4612	10 Microhenries
L18	Shunt Peaking Coil	9.5Ω		29508	19-4180	TV-183	6179	180 Microhenries, Wound on 39KΩ resistor
L19A B	4.5MC Trap Sound IF	1.8Ω 2.6Ω		29563				
L20	Shunt Peaking Coil	15Ω		29577	19-4400 *		6136 *	400 Microhenries, Wound on 18KΩ resistor
L21	Ratio Det.	3.9Ω	.3ΩCT	29054	17-3493	TV-115 ■	1498	Tertiary Winding =.6Ω

* Parallel with 18KΩ resistor.
■ Use adaptor plate.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L22	65Ω		29589A	19-1576	TV-163	6210			HS-5	

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L23	.260A	38.5Ω	1HY	27006B 27006A ①	C5037	C2996	C2326	26C44	C-23X

① Use as alternate.

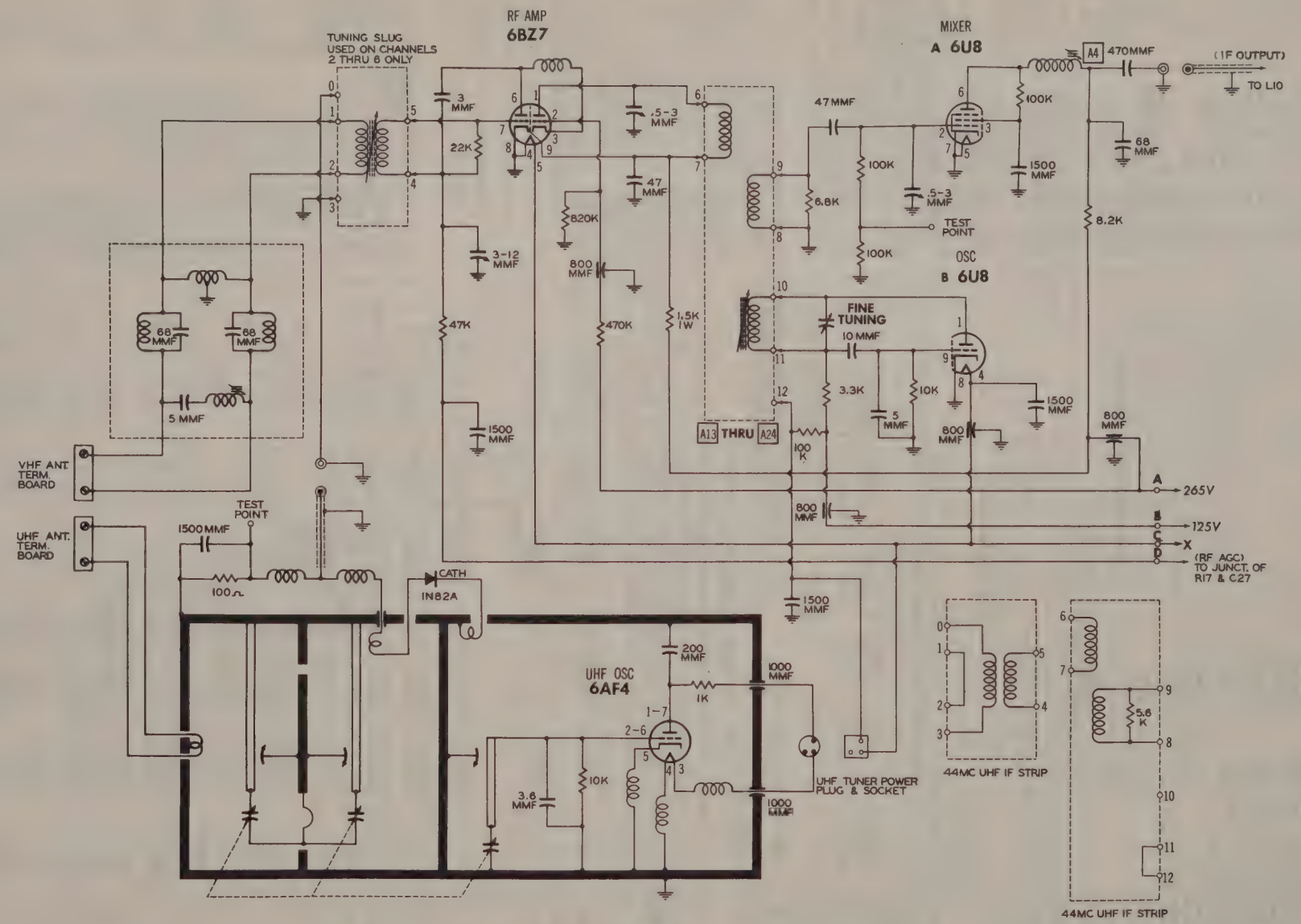
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Packard-Bell PART No. FUSE	Packard-Bell PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	3/16A 125V	45006		313.187 (3AG S/B 3/16A)	357001	MDL 3/16	4405

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M2	Dial Light	54002	#47
M3	Tuner	10543B *	VHF-Used in VHF Models only.
M4	Tuner	10544	VHF-UHF Combination, VHF-UHF Models.
M5	Centering Device	34045A	Includes Deflection Yoke (T4) Rear Cover
M6	Ion Trap	28106A	
	Cabinet		Specify Model Number and Finish
	Knob	52144A	Fine Tuning-VHF Models Only.
	Knob	52143A	Channel Selector-VHF Models Only.
	Knob	52135	Fine Tuning-VHF-UHF Models Only.
	Knob	52137	VHF Tuning- VHF-UHF Models Only.
	Knob	52138	UHF Dial-VHF-UHF Models Only.
	Knob	52120	Brightness or Vertical Hold
	Knob	52120-AE	Tone
	Knob	52121	Horizontal Hold
	Knob	52134A	Contrast
	Knob	54002	On-Off-Volume
	Safety Glass	55064	Used in Models with 21" Pix Tubes.
	Safety Glass	55062B	Used in Models with 24" Pix Tubes.
	Mask	55065A	For 21" Models
	Mask	55063A	For 24" Models

* Alternate Part No. 10543A.



UHF-VHF TUNER PART NO. 10544 USED WITH UHF-VHF MODELS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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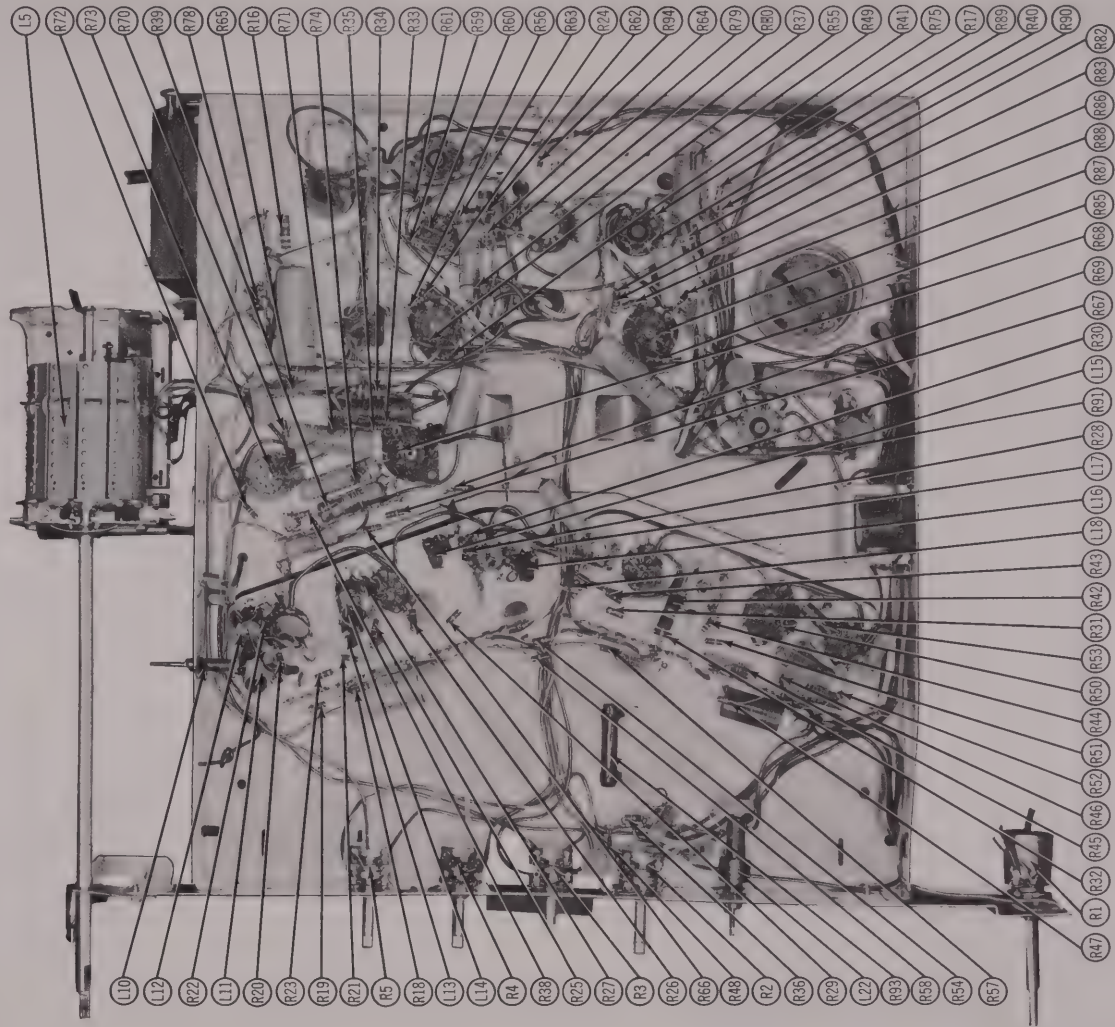
ALTERNATE VHF-UHF TUNER SCHEMATIC

PACKARD-BELL MODELS 21DC1, -U, 21DC2, -U, 21DD1, -U, 21DT1, -U, 24DC1, -U, 24DD1, -U, 24DT1, -U (Ch. 98D1)

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No		REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	RF Amplifier	6BQ7A	
V2	[illegible]	[illegible]	
V3	1st. Video IF Amplifier	6CB6	
V4	2nd. Video IF Amplifier	6CB6	
V5	3rd. Video IF Amplifier	6CB6	
V6	[illegible]	6AS8	
V8	Video Output-Vert. Mult	6AW8	
V7	AGC Keying-Sync Amplifier	6AN8	
V8	Sound IF Amplifier	6AU6	
V9	Ratio Detector-AF Amp.-AGC Clamper	6T8	
V10	Audio Output	6AQ5	
V11	Sync Separator	6BY6	
V12	Vert. Mult.-Vert. Output	6S4	
V13	Horiz. AFC	6AL5	
V14	[illegible]	6CG7	
V15	Horiz. Output	6BQ6GTB	6CU6-6BQ6GA maybe used in some versions
V16	Damper	6AX4GT	
V17	[illegible]	1B3GT	
V18	LV Rectifier	5U4GB	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: Packard-Bell PART No.	GENERAL ELECTRIC	SYLVANIA	NOTES
V19	21ALP4A ③	21ALP4A/B ①	21ALP4A/ ① Aluminized B ② Silver screen "85"	
	21ALP4A ③	21ALP4A ①		
	21ALP4B ①			
	21KLP4			
	24DP4A ③	24DP4A ①	24DP4A ①	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: Packard-Bell PART No	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	≡100	350	24091	AFH3-41	FP227-7	TM-3128	D-175	R2162 *
B	≡100	350					MTD-3520	
C2A	≡100	350	[illegible]	AFH3-155-	[illegible]	TM-3143	Q-470	R2161 *
B	≡25	25		[illegible]	TC26			
C	≡10	475						
C3	25	25	24006A (Note 1)	PR325V25	BR352	TC75	TD-25-25	FM-0235	TVA-1205
C4	5	50	[illegible]	BRE50V5	BR350	TC30	TD-5-50	MMT-0505	TVA-1303

Note 1. Used only in chassis stamped with number 821 or higher.
* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: Packard-Bell PART No	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	[illegible] PART No.	MALLORY PART No.	[illegible] PART No.	NOTES
C5	3.5									
C6	180			NPO-DH180	DD-121	T232	81J-121		5TCC-T12	
C7	6.8			NPO-DH6.8	TCZ-6R8	Z013	NP0A-6R8	2T-5568	5TCCB-V68	
C8	6.8			NPO-DH6.8	TCZ-6R8	Z013	NP0A-6R8	2T-5568	5TCCB-V68	
C9	3-12									
C10	1000									
C11	3.2			NPO-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C12	1000			[illegible]	[illegible]	K069	801-001	DC-521	5HK-D1	
C13	5-3			[illegible]	[illegible]		3139-01-0R5	CT56SA		
C14	1000									
C15	1000									
C16	60									
C17	5-3				529-3		3139-01-0R5	CT56SA		
C18	1.5			NP0-SI1.5	TCZ-1R5	Z004	NP0A-1R5	2T-5515	5TCCB-V15	
C19	10									
C20	10									
C21	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C22	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C23	1000				[illegible]					
C24	120			NP0-DH120	DD-121	T232	81J-121		5TCC-T12	Note 2
C25	470			BPD-00047	DD-471	G060	81J-471	DC-5347	5GA-T47	
C26	5000		23931	BPD-005	DD-502	K080	[illegible]	DC-525	5HK-D5	
C27	1.0	100	23940	PZ6SN-1.0	[illegible]	[illegible]	PT41		2TM-M1	
C28	3000		23931	BPD-005	DD-502	K080	81J-005	DC-525	5HK-D5	
C29	3.2		23969	NP0-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C30	30				TCZ-30	Z038	NP0L-300			
C31	22			NP0-SI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C32	2.2		23969	NP0-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C33	1000		23965	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C34A	10000		23963	BPD-2X01	DD3-103	DK082	81J-01	DC-511	5HK-Z01	
B	10000						81J-01	DC-511		
C35	1000		23965	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	2.2		23969	NP0-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C37	22			NP0-SI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C38	1000		23965	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	1.0	100	23940	PZ6SN-1.0		[illegible]	PT41		2TM-M1	
C40	5000		23931	BPD-005	DD-502	K080	81J-005	DC-525	5HK-D5	
C41	10000		23939	BPD-01	DD-103	K082	81J-01	DC-511	5HK-Z01	
C42A	10000		23962	BPD-2X01	DD3-103	DK082	81J-01	DC-511	5HK-Z01	
B	10000						81J-01	DC-511		
C43	3.7		23978	NP0-DH3.7	TCZ-4R7	Z010	NP0A-4R7	2T-5547	5TCCB-V47	
C44	.047	200	23105	BPD-03	DF-303	CUBD347		PT4147	2TM-S47	
C45	1	100	24145	PZ6SN-1	DF-104	CUB6P1		PT601	6TM-P1	
C46	470		23946	BPD-00047	D6-471	K060	81J-471	DC-5347	5GA-T47	
C47	470	1000	23967	BYD-15-470	DD-471	VT47	1R3EY-471	MC1347	1GA-T47	Note 10
C48A	10000		23963	BPD-2X01	DD3-103	DK082	81J-01	DC-511	5HK-Z01	
B	10000						81J-01	DC-511		
C49	5000		23931	BPD-005	DD-502	KD80	[illegible]	DC-525	5HK-D5	
C50	0033	400	23117	BPD-0033	D6-332	CUBD333	GP2-333-332	PT6233	6TM-D33	
C51	047	200	23105	BPD-05	DF-503	CUBS347		PT4147	2TM-S47	
C52	10000		23939	BPD-01	DD-103	K082	81J-01	DC-511	5HK-Z01	
C53	10000		23939	BPD-01	DD-103	K082	81J-01	DC-511	5HK-Z01	
C54	10000		23939	BPD-01	DD-103	K082	81J-01	DC-511	5HK-Z01	
C55	022	600	23141	BPD-02	DF-303	CUB6S22	417-02	PT6122	6TM-S22	
C56	005	600	23127	BPD-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C57	10000		23939	BPD-01	DD-103	K082	81J-01	DC-511	5HK-Z01	
C58	56		23922	NP0-5156	TCZ-56	Z036	NP0-337-560			
C59	0033	400	23117	BPD-0033	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C60	220		23915	DM-00022	DD-221	YT22	[illegible]	[illegible]	5GA-T22	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING: CAP.	VOLT	REPLACEMENT DATA: Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	[illegible] PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C61	.1	200	23107	P288N-1	DF-104	CUB2P1	[illegible]	PT401	2TM-P1	
C62	12000		23952	TPA-501	TPC-104				1103C12	Note 3
C63	.0033	400	23052	1464-0033		CUB6D33	GP2-333-332	[illegible]	6TM-D33	Note 4
C64	.1	200	23107	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C65	1000		23965	[illegible]	DD-102	[illegible]	801-001	DC-521	5HK-D1	
C66	1000		[illegible]	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C67	.01	600	[illegible]	D6-103	D6-103	[illegible]	GP3-333-103	PT6L	6TM-S1	
C68	.047	200	23105	BPD-05	DF-503	CUBS247		PT4147	2TM-S47	
C69	.1	600	23145	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C70	.05	600	23051	BPD-05	DF-503	CUBS5S		PT615	6TM-S5	
C71	.33	200								
C72	68				TC2-91	T229	NP0-337-B10			Note 5
C73	120		[illegible]	NP0-DH120	TCZ-120	G044	NP0-333-121		5TCC-T12	Note 6
C74	1000		[illegible]	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C75	.005	600	[illegible]	1464-005		CUB6D5	GP2-333-502	PT625	6TM-D5	Note 6
C76	.0033	400	[illegible]	[illegible]	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	Note 7
C77	.01	200	23106	P288N-15		CUB2P15		PT4015	2TM-P15	
C78	1000		23965	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C79	470	500		1464-00047	D6-471	5RS747	81J-471		MS-347	Note 8
C80	4000		23206			1RS504		[illegible]	[illegible]	
C81	.1	200	23107	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	Note 6
C82	330	500	23221	1469-00033	D4-331	[illegible]	81J-331		MS-333	
C83	.022	600	[illegible]	BPD-02	DF-303	CUB6S22	417-02	PT6122	6TM-S22	
C84	1	600	23145	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C85	1000		[illegible]	BPD-01	DD-103	[illegible]	81J-01	DC-511	5HK-S1	
C86	047	600	[illegible]	BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C87	.1	600	23145	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C88	120	2000	23975		DD3-121				2GGA-T12	
C89A	10000		23982A	BPD-2X01	DD3-103	DK082	81J-01	DC-511	5HK-Z01	
B	10000						81J-01	DC-511		
C90	220			SI230	D6-221	TP30	81J-221	DC-5322	5GA-T22	Note 7

! Items C82 and R95 are combined in one unit.
Note 2. Item C24 is a 6SMM7 unit in case 1D543A.
Note 3. Late production sets use integrator 23918 in this application and item C63 was deleted from circuit.
Note 4. Item C63 was changed from standard tolerance to ± 10% unit.
Note 5. In early production models item C72 was 68MMF (NPO-5%).
Note 6. Deleted from circuit in late production models.
Note 7. Added in late production models.
Note 8. Early versions use a 330MMF unit (part #2322J) in this application.
Note 9. Not used in some versions.
Note 10. Late versions may use a 56MMF ⓖ 4KV unit in this application.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	1500Ω		25888	F1-7			UF152R	Contrast (Panel)
B	500KΩ			R2-47			UR55-T54	Volume tapped at 90KΩ (Rear)
C	Switch			KB-1			US-28	Attach to R1B.
D	Cover			KB-5				Attach to R1C.
R2A	250KΩ		25889	F1-40		* QJ-898	UE1424	Tone (Panel)
B	50KΩ			R2-29				Horiz. Drive (Rear)
R3A	5Meg		25883			**QJ-880	UE3300	Picture - Note 1 (Panel)
B	7.5Meg							Vert. Size (Rear)
R4A	50KΩ		25884	F1-29		◆ QJ-882	UF54L	Brightness (Panel)
B	50KΩ			R2-29			UR54L	AGC (Rear)
R5A	150KΩ		25883	F1-32		◆◆QJ-879	UE1251	Vert. Hold (Panel)
B	3Meg			R2-78				Vert. Linearity (Rear)

Note 1. Some versions will use an alternate control Part No. 25883A in this application.
* Concentrikit Equivalent: K-5 Kit, Base Elements and Shafts; B1J-123 & P9-113 (Panel) B1J-123 & R15-028 (Rear)
**Concentrikit Equivalent: K-5 Kit, Base Elements and Shafts; B1J-141 & P11-034 (Panel) B1J-142 & R15-017 (Rear)
◆ Concentrikit Equivalent: K-2 Kit, Base Elements and Shafts; B1J-123 & P9-112 (Panel) B1J-123 & R15-028 (Rear)
◆◆Concentrikit Equivalent: K-2 Kit, Base Elements and Shafts; B1J-129 & P9-113 (Panel) B1J-140 & R15-028 (Rear)
† Universal Replacement (Mallory Exact Duplicate Part No. UE977).

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Packard-Bell PART No.	IRC PART No	NOTES
R6	680Ω			BTS-680K	
R7	4700Ω			BTS-4700	
R8	820KΩ			BTS-820K	
R9	470KΩ			BTS-470K	
R10	200KΩ			BTS-220K	
R11	10KΩ				
R12	2.2Meg				
R13	5600Ω				
R14	47KΩ				
R15	300Ω			BTS-1000	
R16	3900Ω		23232	BTA-3900	
R17	33000Ω		23231	BTS-3300	
R18	22KΩ		23041	BTS-22K	
R19	1200		23014	BTS-120	
R20	10KΩ		23037		
R21	1000Ω		23025	BTS-1000	
R22	820Ω		23028	BTS-82	
R23	3300Ω		23031	BTS-3300	
R24	470KΩ		23157	BTS-470K	
R25	15KΩ		23039		
R26	1000Ω		23025	BTS-1000	
R27	82Ω		23012		
R28	3300Ω		23031		Note 1
R29	1000Ω		23025	BTS-1000	
R30	270Ω		23018	BTS-270	
R31	1500Ω		23027	BTS-1500	
R32	1800Ω		23029	BTS-1800	
R33	470KΩ		23157	BTS-470K	
R34	4700Ω	2	23433	BTB-4700	
R35	180Ω		23016	BTS-180	Note 2
R36	56KΩ		23046	BTS-56K	
R37	220KΩ		23153	BTS-220K	
R38	15KΩ 5%		23039-1	BTS-15K 5%	Note 3
R39	470KΩ		23157	BTS-470K	
R40	470KΩ		23157	BTS-470K	
R41	3300Ω		23031	[illegible]	
R42	10KΩ		23437	BTB-10K	
R43	150Ω		23015	BTS-150	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Packard-Bell PART No.	IRC PART No	NOTES
R44	[illegible]		23021	BTS-470	
R45	10KΩ		23037	BTS-10K	
R46	10KΩ		23037	BTS-10K	
R47	27KΩ		[illegible]	BTS-27K	
R48	33KΩ		23043	BTS-33K	
R49	2.2Meg		23165	BTS-2.2Meg	
R50	4.7Meg		[illegible]	BTS-4.7Meg	
R51	220KΩ		23058	BTS-220K	
R52	470KΩ		23157	BTS-470K	
R53	5600Ω 5%	2	23423	BTB-560 5%	
R54	10KΩ		23037	BTS-10K	
R55	[illegible]		23035	BTS-6800	
R56	270Ω		23018	BTS-270	
R57	15KΩ		[illegible]	BTS-15K	
R58	[illegible]		23151	BTS-330K	
R59	[illegible]		23157	BTS-470K	
R60	2.2Meg		23165	BTS-2.2Meg	
R61	560KΩ		23059	BTS-560K	
R62	22KΩ	2	23441	BTB-22K	Note 4
R63	6800Ω	2	23436	BTB-6800	
R64	33KΩ		23043	BTS-33K	
R65	38.4Ω		†23960		
R66	22KΩ		23041	BTS-22K	
R67	[illegible]		23053	BTS-220K	
R68	[illegible]		23157	BTS-470	
R69	[illegible]		23041	BTS-22K	
R70	10KΩ		23037	BTS-10K	Note 5
R71	1.5Meg		23163	BTS-1.5Meg	
R72	270KΩ		23054	BTS-270K	
R73	180Ω		23016	BTS-180	
R74	470KΩ		23157	BTS-470K	
R75	150KΩ		23151	BTS-150K	
R76	56KΩ		[illegible]		
R77	5.6Ω		[illegible]		
R78	100Ω		23035		Note 6
R79	1Meg		23061		
R80	1Meg		23061		
R81	22KΩ	2	23441		Note 7

RESISTORS (cont)

ITEM No	RATING: OHMS	WATT	REPLACEMENT DATA: Packard-Bell PART No.	IRC PART No	NOTES
R82	1Meg		23061		
R83	47KΩ		23045		
R84	22KΩ		23041		Note 7
R85	6800Ω		23035		Note 8
R86	2700Ω				Note 9
R87	100KΩ 5%				
R88	150KΩ		23051		

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Packard-Bell PART No.	IRC PART No.	NOTES
R89	820KΩ	1	23080		
R90	10KΩ	2	23437		
R91	12KΩ	4	23047	1.3AA-12K	Note 10
R92	10KΩ	1	23037		
R93	2500Ω	10	[illegible]	[illegible]	
R94	100KΩ	1	23149	BTS-100K	

Note 1. Chassis stamped below 804 use a 6800Ω ½W resistor in this application.
Note 2 Chassis stamped below 883 use a 100Ω ½W resistor in this application.
Note 3. Chassis stamped below 839 use a 12KΩ ½W 5% resistor in this application.
Note 4. Use with heat dissipating hand, if hand is not used wattage must be doubled.
Note 5. Not used in some versions. In those versions, mfgr. recommends resistor be added to improve vertical stability.
Note 6 Not used in some versions.
Note 7 Not used in chassis stamped 886 or higher.
Note 8. Chassis stamped below 886 use a 2200Ω ½W resistor in this application.
Note 9. Chassis stamped below 886 use a 150KΩ ½W resistor in this application.
Note 10. Some versions use 8- 63000 2 W, 5% resistors in series in this application.
† Items R65, C63 are combined in one unit.

TRANSFORMER (POWER)

ITEM No	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: Packard-Bell PART No.	Hallderson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	550VCT	5V	6.3V	69058A					
	② 1.66A	③ 280A	② 3A	② 9A						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No	Hallderson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Horiz. Output Trans.	89468B	FB240 & RF800 *	BVO-54 * ①		X129 *①	A-8255 * ①	FLY-76 *	D-49 * ①
T3	Vert. Output Trans.	89434C	Z1806	A-3039	236T1	V312	A-8141	28354	A-104X
T4A	Yoke(90°) Horiz.(23MP	29590B					DY-23A		
B	Vert.(40MM)								
		29590A ② 29045A ③					DY-23A		

① Drill new mounting hole(s).
② Alternate Packard-Bell Part Number.
③ Take rear cover and centering device.
④ Use original rear cover and centering device.
⑤ Use original horizontal yoke damping network.
* RF800 not required with chassis mentioned in note ③ below.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Hallderson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	8	5	5	5	5	5	5
	8	8	4	4	4	4	4	4
	4	N.C. See Note ⑤	N.C. See Note 6	N.C. See Note ⑤	N.C. See Note ⑤	N.C. See Note ⑤	N.C. See Note ⑤	N.C. See Note ⑤
	3	2-Also See Note ⑤	2	2	2	2	2	1
	2	1	Jumper 1 & 7	Jumper 1 & 7	Jumper 1 & 7	Jumper 1 & 7	Jumper 1 & 7	Jumper 2 & 3
	1	See Note 7	8	8	8	8	8	4
Connect Width Coil Across		Terms #1 & #3 of RF800 Across 3 & 4						
Special Notes		⑤	③ ⑦ ⑤	③ ⑤	⑦ ⑤	③ ⑤	⑦ ⑤	B B

⑤ To reduce yoke "ringing", install 1000Ω ② 1W in series with C57 across terms. #2 & #1 of horizontal yoke.
⑦ Connect terminal #4 of RF800 to ground, terminal 3 to R81 (original transformer terminal #1 lead). If the picture is out of phase, reverse these connections.
B In chassis marked 886 (or higher) original transformer terminal #1 is not used as source of horizontal AFC pulse. In those chassis, ignore data shown pertaining to original terminal #1. Also, no jumper will be necessary in data shown for original terminal #2.
③ Adjust value of capacitor C47 until required peak to peak pulse voltage at plate of AGC keyer tube V7A is obtained.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC	Packard-Bell PART No	Hallderson PART No.	Merit PART No.	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T5	4.7KΩ	3-4Ω	89436A	Z1107	A2950	A3850	24851	S-3X	

SPEAKER

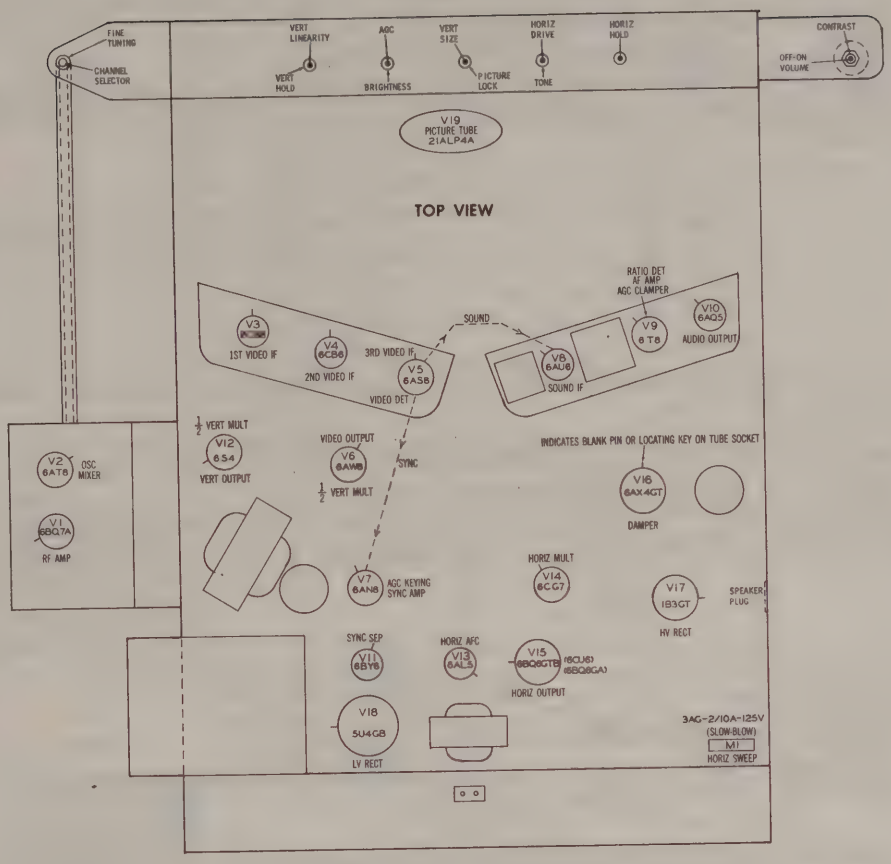
ITEM No.	SIZE	FIELD	V C IMP.	Packard-Bell PART No.	OUAM PART No.	RCA TYPE No	NOTES
SP1	6" x 9"	PM	6.4Ω	83112 ① 83113 ②	69A2 69A22S.4	23881	① Used in Model 21DT1 ② Two used in Models 21DC1, 21DC2, 21DD1, 24DC1, 24DD1, & 24DT1

COILS (RF-IF)

ITEM No	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Matching Trans.	0Ω	0Ω					
L2	Ant. Matching Trans.	0Ω	0Ω					
L3	IF Trap		2Ω					
L4	FM Trap	0Ω						
L5	Ant., RF, Mixer Grid, Osc. Coils	0Ω						
L6	FIL Choke	0Ω						
L7	Neut. Coil	0Ω						
L8	RF Coil	0Ω						
L9	Conv. Plate	1Ω						
L10	1st Video IF	1Ω	1Ω	29584		TV-131		

PACKARD-BELL MODELS 21DC1, -U, 21DC2, -U, 21DD1, -U, 21DT1, -U, 24DC1, -U, 24DD1, -U, 24DT1, -U (Ch. 98D1)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V18

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V19
Has pic, no sound - V8, V9, V10
Overloaded picture - V7, V9

SYNC FAILURE
No vert. sync - V6, V11, V12
No horiz. sync - V11, V13, V14
No vert. or horiz. sync - V7, V11

SWEEP FAILURE
No raster, has sound - V14, V15, V16, V17, V19, Fuse (M1)
No vertical deflection - V6, V12
Poor vert. linearity or foldover - V6, V12
Poor horiz. linearity or foldover - V14, V15, V16
Narrow picture - V14, V15, V16, V17, V18
Vert. off freq. - V6, V11, V12
Horiz. off freq. - V11, V13, V14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from chassis. Do not remove the horizontal multivibrator tube (V14) to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C28. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over osc.-mixer tube. Low side to chassis.	47.25MC (Unmod.)	Between any two channel	DC probe to point (A). Common to chassis.	A1, A2	Increase signal generator output for useable reading on VTVM. Adjust for MINIMUM deflection on VTVM.
2.	"	"	39.75MC	"	"	A3	"
3.	"	"	45.5MC	"	"	A4, A5	Attenuate signal generator output for approximately 3 volts on VTVM. Adjust for maximum deflection.
4.	"	"	41.8MC	"	"	A6	"
5.	"	"	43.3MC	"	"	A7	"
6.	"	"	44.5MC	"	"	A8	"

OVERALL VIDEO IF RESPONSE CHECK

Couple a signal generator to an ungrounded tube shield floating over converter tube to provide markers on the response curve. Connect a .1MFD/100 volt capacitor from point (B) to chassis.
Set AGC switch in normal position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	43MC (10MC Swp.)	39.75MC 41.25MC 43.3MC 45.0MC 45.75MC 47.25MC	3	Vert. Amp. thru 22KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. The 39.75MC and 47.25MC markers should be at MINIMUM response. To view these markers use high scope gain and increase sweep generator output. The 45.0MC marker should not exceed 97% and the 41.25MC marker should not exceed 12%. If necessary, slightly retouch A4 thru A8 for desired response.

4.5MC TRAP ALIGNMENT

Turn the contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe thru detector (Fig. 2) to pin 11 (cathode) of picture tube. Common to chassis.	A9	Adjust for MINIMUM deflection.

ALTERNATE 4.5MC TRAP ALIGNMENT

Restore the set to normal operating condition and tune in a local TV station. Adjust A9 for MINIMUM 4.5MC beat in picture.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point (C). Common to chassis.	A10, A11	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point (D). Common to point (E).	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp.)	4.5MC	Any non-interfering channel	Vert. Amp. to point (C). Low side to chassis.	A10, A11	Disconnect stabilizing capacitor C4. Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
10.	"	"	"	"	"	Vert. Amp. to point (D). Low side to chassis.	A12	Reconnect C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. Slightly retouch A11 for maximum amplitude and straightness of crossover lines.

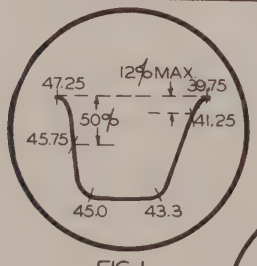


FIG. 1

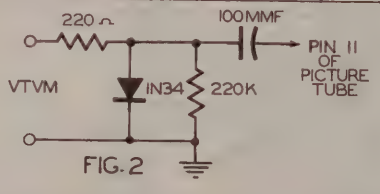


FIG. 2

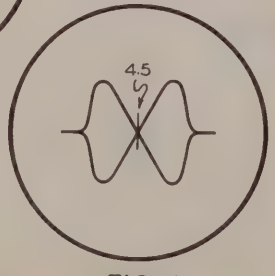


FIG. 4

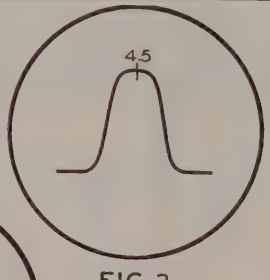


FIG. 3

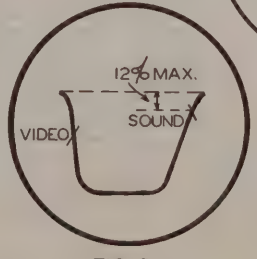


FIG. 5

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

The channel oscillator screws are reached thru a hole just above the fine tuning shaft. The correct VHF oscillator adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

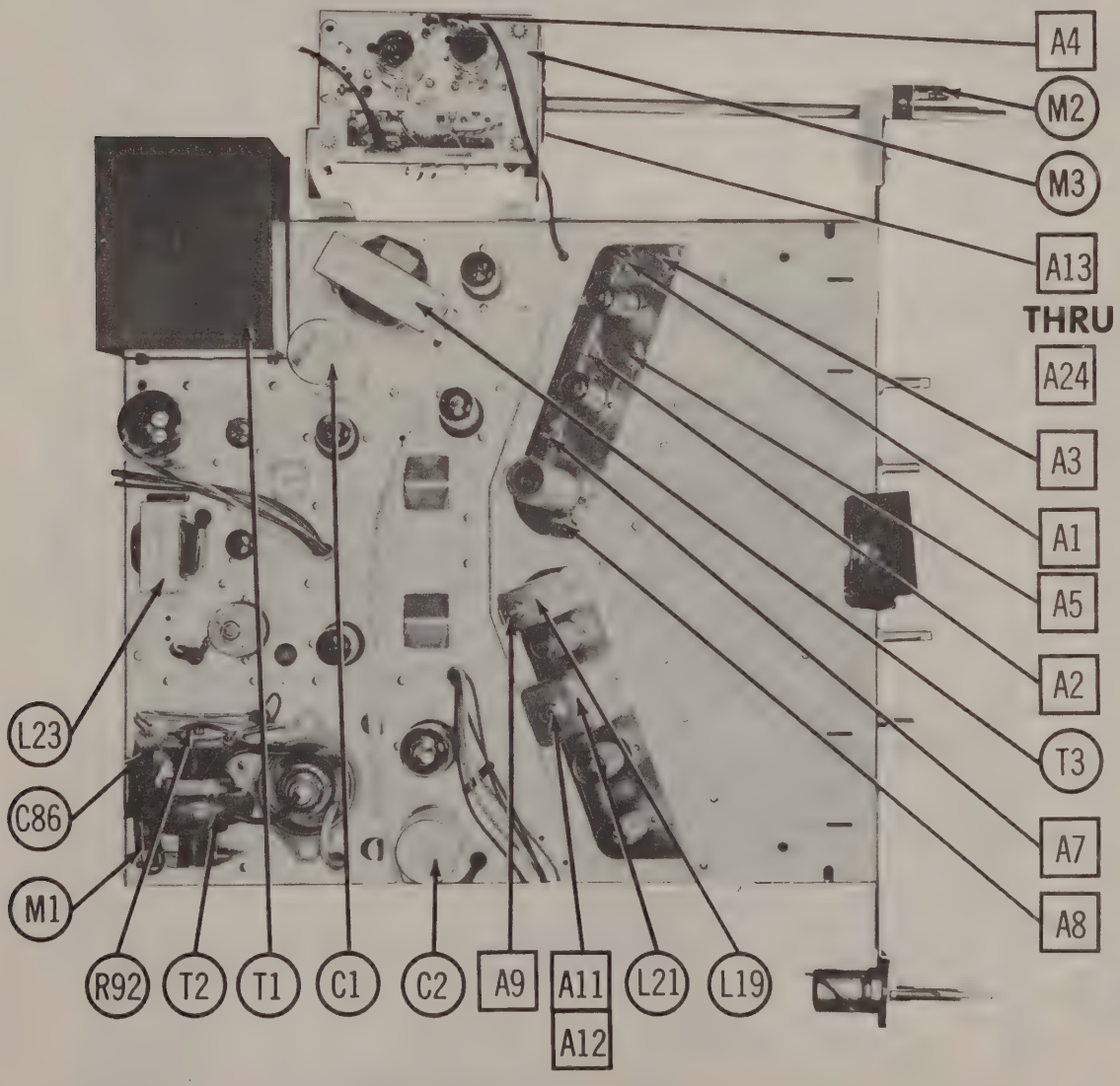
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp.)	211. 25MC 215. 75MC	13	Vert. Amp. thru 22KΩ to point (A). Low side to chassis.	A13	Adjust to place video marker at 50% on response curve as in Fig. 5. Sound markers should not exceed 12%.
			207MC (10MC Swp.)	205. 25MC 209. 75MC	12		A14	
			201MC (10MC Swp.)	199. 25MC 203. 75MC	11		A15	
			195MC (10MC Swp.)	193. 25MC 197. 75MC	10		A16	
			189MC (10MC Swp.)	187. 25MC 191. 75MC	9		A17	
			183MC (10MC Swp.)	181. 25MC 185. 75MC	8		A18	
			177MC (10MC Swp.)	175. 25MC 179. 75MC	7		A19	
			85MC (10MC Swp.)	83. 25MC 87. 75MC	6		A20	
			79MC (10MC Swp.)	77. 25MC 81. 75MC	5		A21	
			69MC (10MC Swp.)	67. 25MC 71. 75MC	4		A22	
			63MC (10MC Swp.)	61. 25MC 65. 75MC	3		A23	
			57MC (10MC Swp.)	55. 25MC 59. 75MC	2		A24	

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

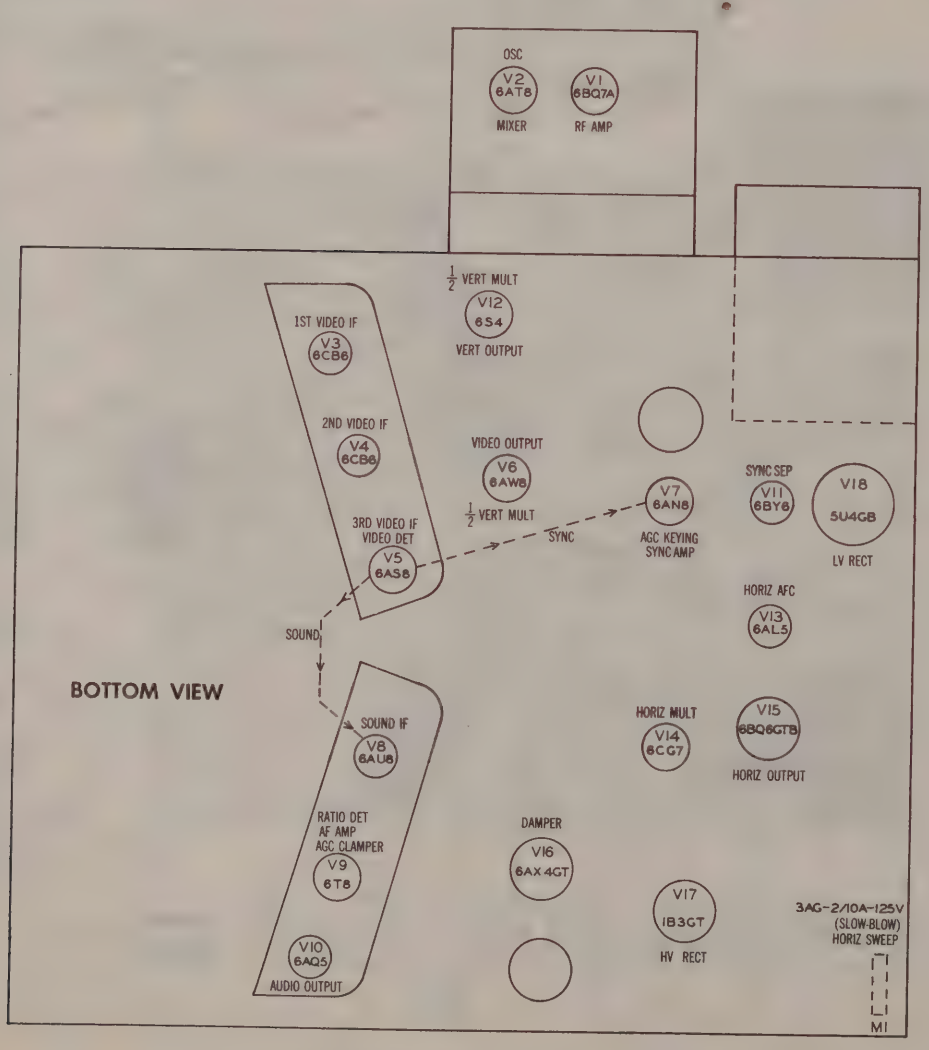


CHASSIS TOP VIEW

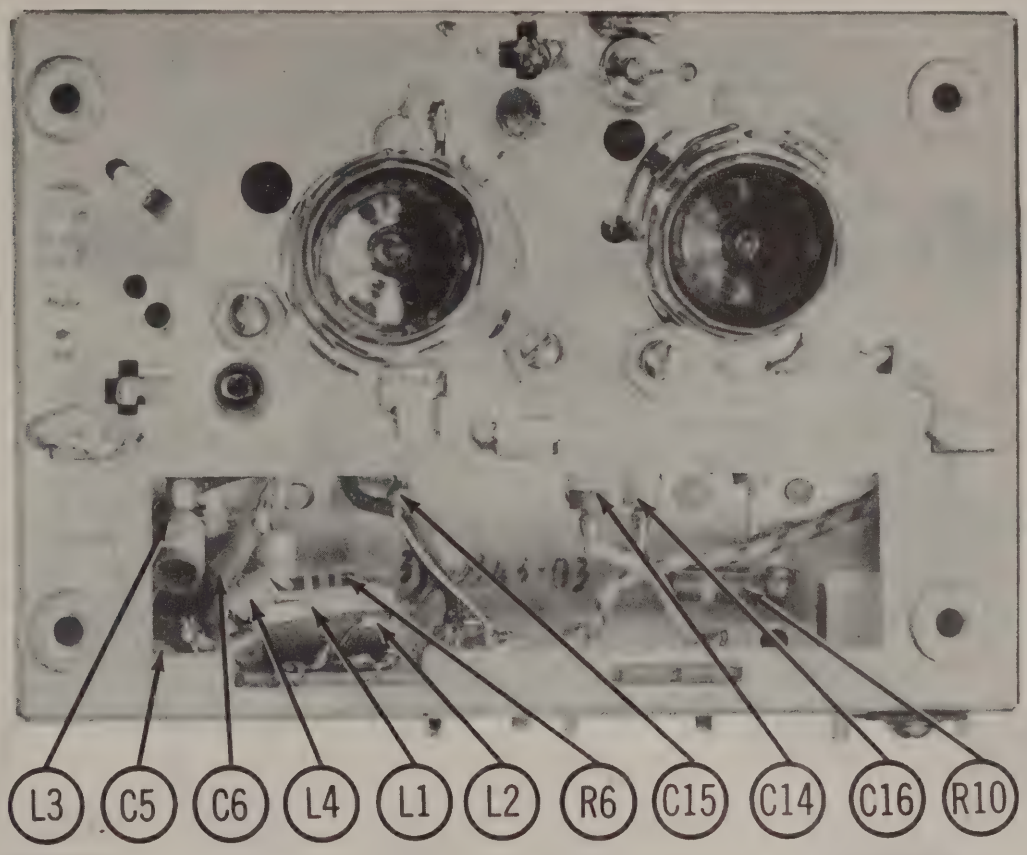
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	650KΩ	0Ω	0Ω	.1Ω	† 3.9KΩ	300KΩ	INF	0Ω
V 2	6AT8	10KΩ	† 6.5KΩ	0Ω	0Ω	.1Ω	† 3.5KΩ	† 50KΩ	0Ω	220KΩ
V 3	6CB6	70KΩ	82Ω	0Ω	.1Ω	† 3.5KΩ	† 3.5KΩ	0Ω		
V 4	6CB6	60KΩ	82Ω	0Ω	.1Ω	† 3.5KΩ	† 3.5KΩ	0Ω		
V 5	6AS8	† 3.5KΩ	.1Ω	270Ω	0Ω	.1Ω	3.3KΩ	0Ω	.1Ω	† 3.5KΩ
V 6	6AW8	80KΩ	470KΩ	• 1.7Meg	0Ω	.1Ω	400Ω	470KΩ	† 2.5KΩ	† 4.7KΩ
V 7	6AN8	† 13KΩ	13KΩ	270Ω	0Ω	.1Ω	400KΩ	† 39Ω	† 5.8KΩ	† 2.5KΩ
V 8	6AU6	2.6Ω	0Ω	0Ω	.1Ω	† 13KΩ	† 13KΩ	150Ω		
V 9	6T8	INF	20KΩ	INF	.1Ω	0Ω	650KΩ	0Ω	4.7Meg	† 220KΩ
V 10	6AQ5	470KΩ	560Ω	0Ω	.1Ω	† 550Ω	† 39Ω	470KΩ		
V 11	6BY6	130KΩ	0Ω	0Ω	.1Ω	† 560KΩ	† 17KΩ	2.2Meg		
V 12	6S4	NC	180Ω	2.2Meg	.1Ω	0Ω	2.2Meg	NC	NC	• 14KΩ
V 13	6AL5	1Meg	0Ω	0Ω	.1Ω	1Meg	0Ω	2Meg		
V 14	6CG7	† 6.8KΩ	3Meg	2.7KΩ	0Ω	.1Ω	† 150KΩ	100KΩ	2.7KΩ	0Ω
V 15	6BQ6GTB	NC	.1Ω	TP	† 10KΩ	600KΩ	NC	0Ω	0Ω	TOP CAP • 11Ω
V 16	6AX4GT	TP	NC	350KΩ	TP	† 39Ω	TP	0Ω	.1Ω	
V 17	1B3GT	PINS 1-8 HAVE INF RESISTANCE								TOP CAP • 326Ω
V 18	5U4GB	NC	20KΩ	NC	20Ω	NC	18Ω	NC	20KΩ	
V 19	21ALP4A	0Ω	500KΩ	PIN 6 • 12KΩ	PIN 10 • 12KΩ	PIN 11 † 220KΩ	PIN 12 .1Ω			

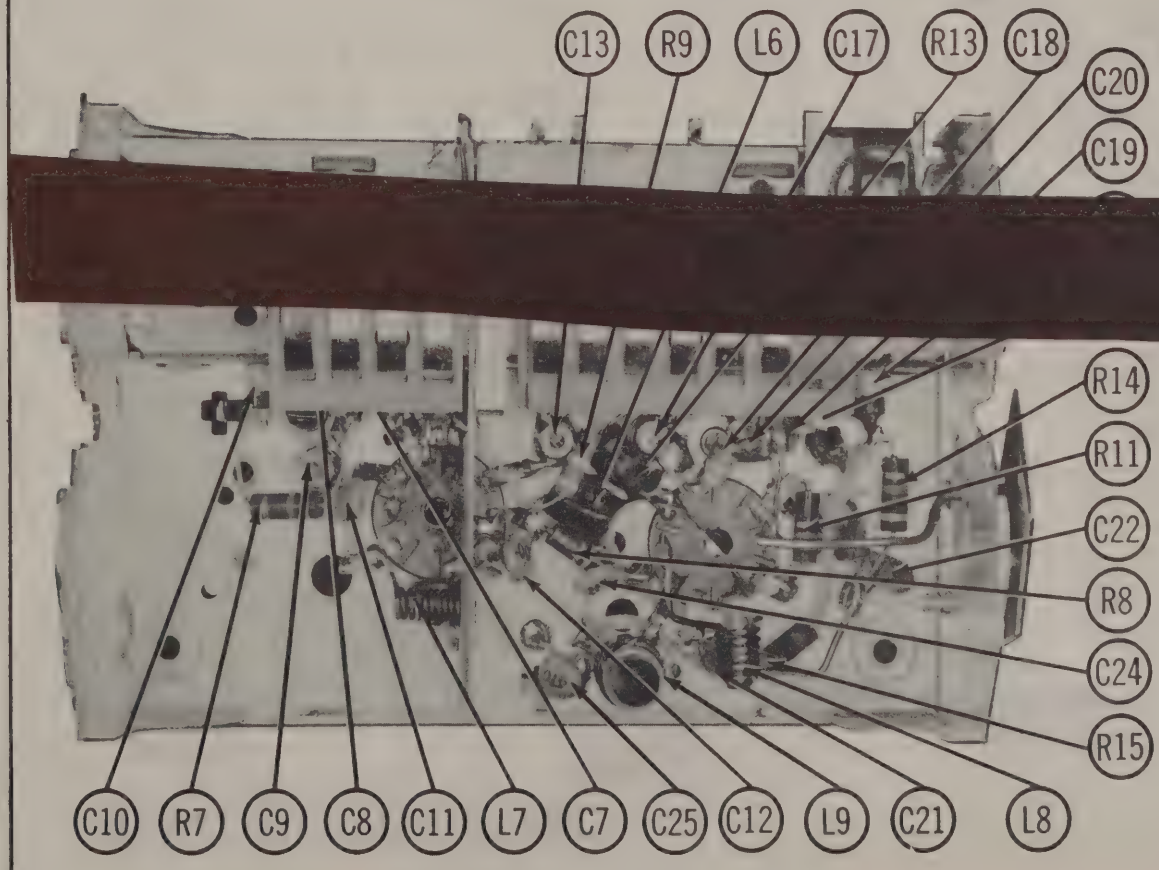
† MEASURED FROM PIN 8 OF V18.
• MEASURED FROM PIN 3 OF V18.
TP-TIE POINT.
NC-NO CONNECTION.



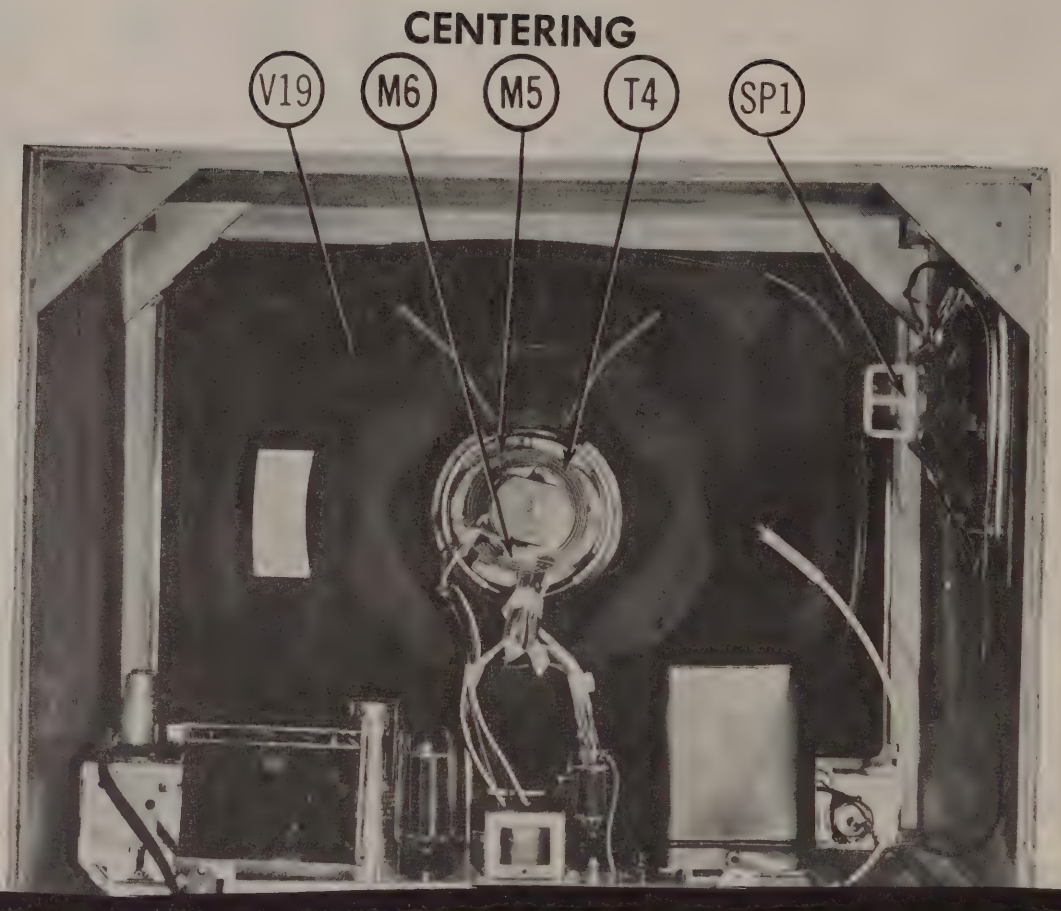
TUBE PLACEMENT CHART



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Adjust the horizontal hold slug (labeled "Horizontal Hold" on the front panel) until picture synchronizes horizontally. Momentarily remove the signal by switching off channel and back again. If necessary, SLIGHTLY retouch the horizontal hold slug for best lock-in action.

Adjust the horizontal drive control (R2B) in a clockwise direction as far as possible without the presence of vertical white lines or compression near the center of the picture.

PHOTOFACT* Folder

PHILCO MODEL S24D6018 (Ch. TV396), 24D6120L, M, 24D6122L, M (Ch. TV394)

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PHILCO MODEL 24D6120M

TRADE NAME	Philco Models 24D6018 (Ch. TV-396) 24D6120L, 24D6120M, 24D6122L, 24D6122M (Ch. TV-394)
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC-60Cycle RATING 1.72 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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PHILCO MODEL S24D6018 (Ch. TV396), 24D6120L, M, 24D6122L, M (Ch. TV394)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove plastic knob cover and 8 push-on type control knobs from front panel of cabinet.
2. Remove 9 metal screws. Remove rear cover.
3. Disconnect speaker leads, picture tube socket, HV lead and yoke plug.
4. Remove channel selector switch from right side of cabinet top. and off-on switch from left side on cabinet top.
5. Remove 4 chassis mounting bolts. Remove chassis.
6. Remove 2 speaker nuts. Remove speaker.

MODEL	CHASSIS
24D6018	TV-396
24D6120L, 24D6120M, 24D6122L, 24D6122M	TV-394

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws holding wood strip at the top edge of the safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

To adjust the horizontal oscillator remove the rear cover and supply power to the set. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator control (R8) until the picture synchronizes horizontally. R8 is located on top of the chassis.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L40) located on top of the chassis.

FUSES

Five (5) fuses are used ; 2 for remote control unit protection, 2 for filament supply protection and 1 for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

PHILCO MODEL S24D6018 (Ch. TV396), 24D6120L, M, 24D6122L, M (Ch. TV394)

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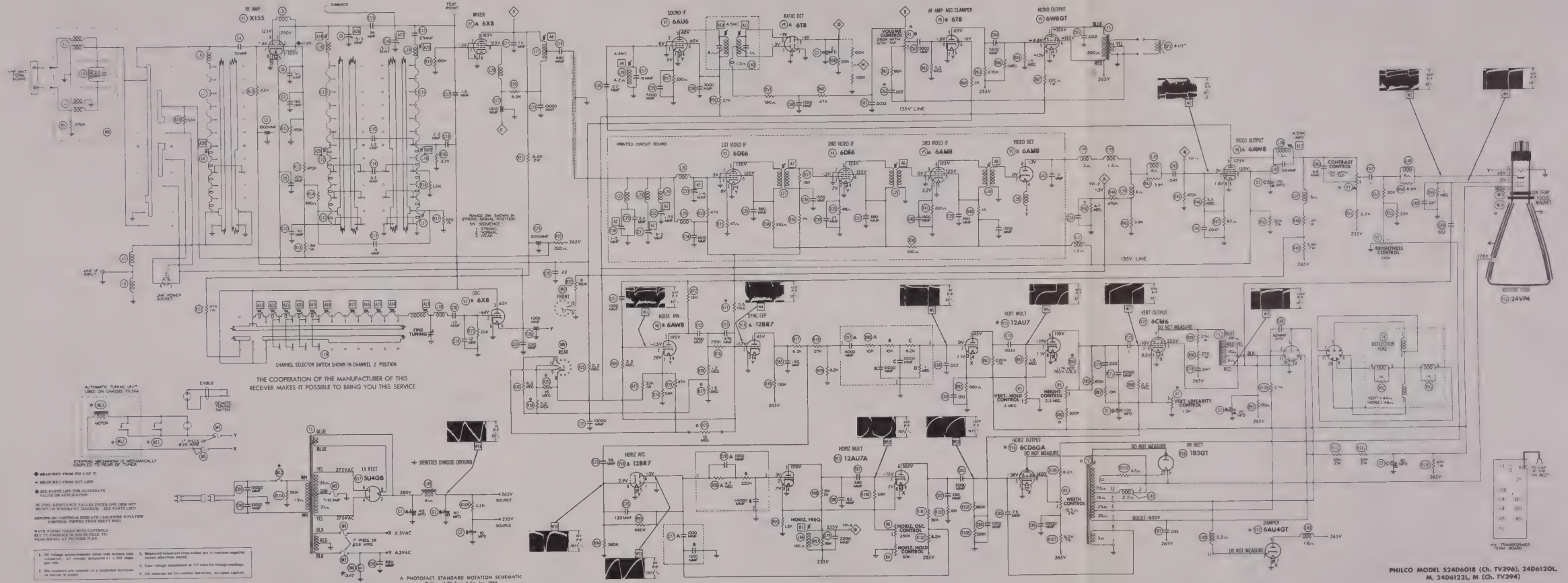
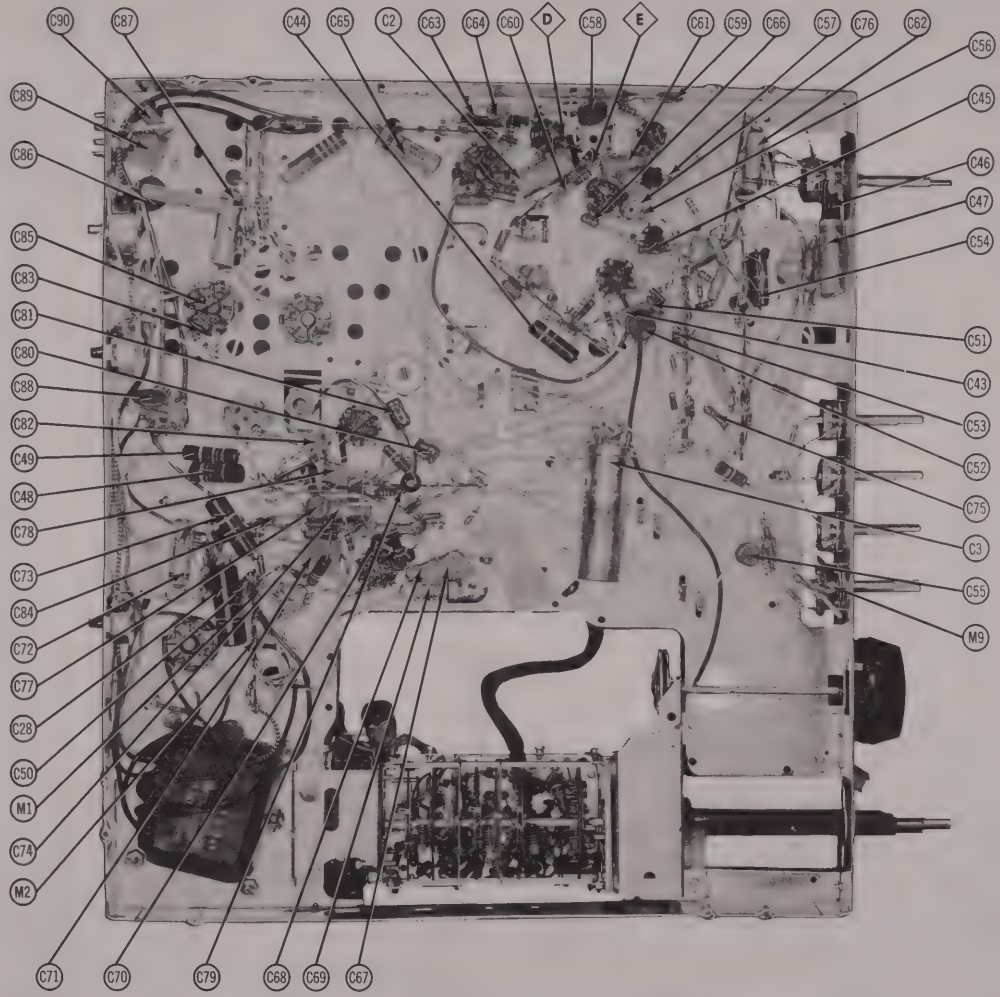
G398

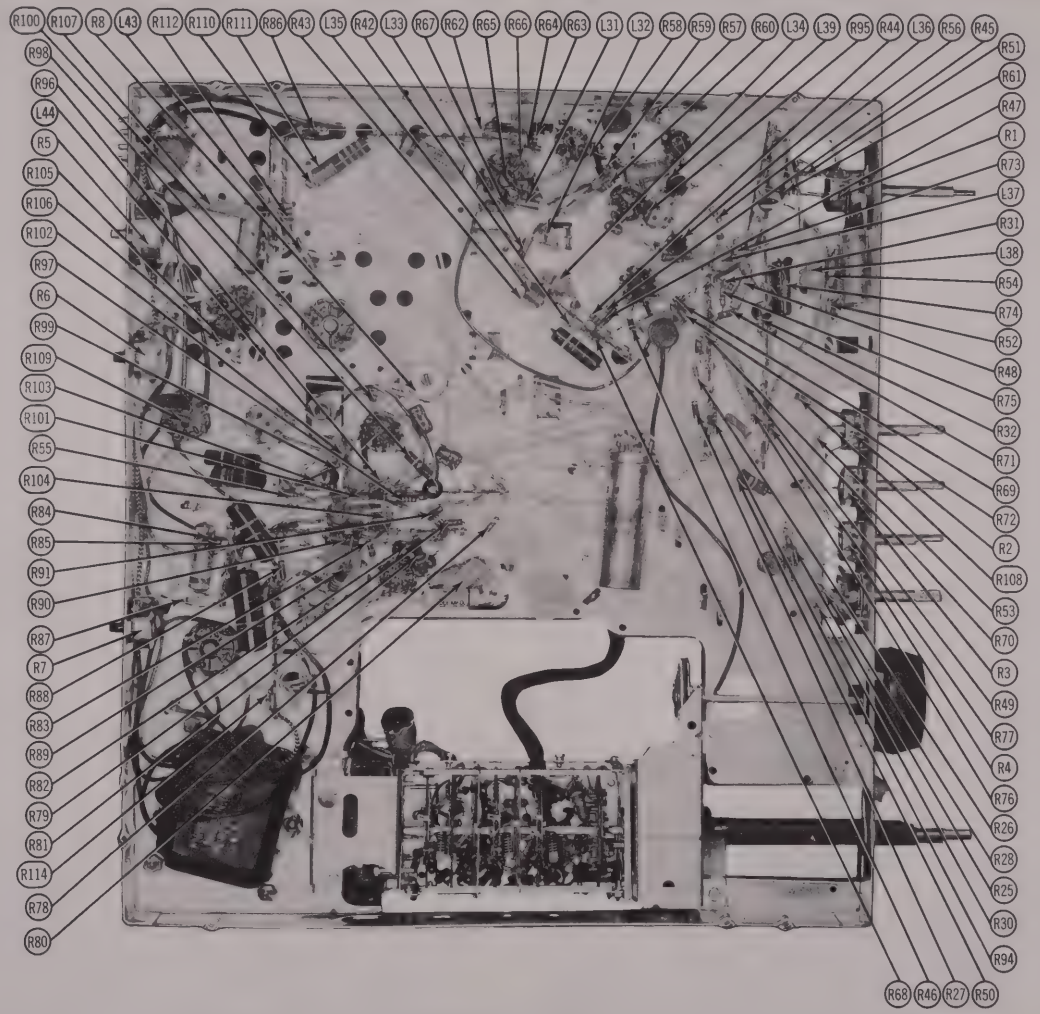
DATE 5-56 SET 318 FOLDER 10



PHILCO MODEL 524D6018 (Ch. TV396), 24D6120L, M, 24D6122L, M (Ch. TV394)

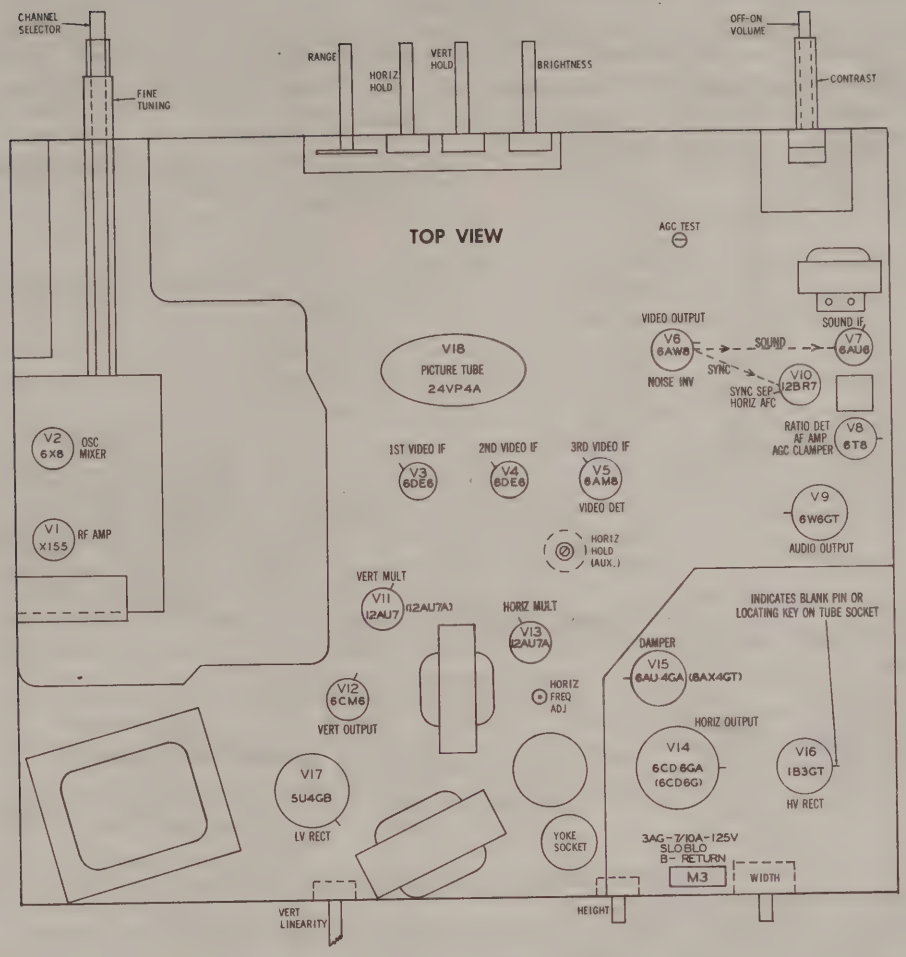


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V17, Fuses (M1, M2, M3)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V18
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V10, V11
No horiz. sync - V10, V13
No vert. or horiz. sync - V10

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V18
No vertical deflection - V11, V12
Poor vert. linearity or foldover - V11, V12
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V16, V17
Vert. off freq. - V10, V11
Horiz. off freq. - V10, V13

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow 15 minutes for receiver and test equipment to warm up. There should be a good bond between chassis and test equipment. Connect the deflection yoke and speaker during alignment. Do not remove the horizontal oscillator (V13) to disable the high voltage. The high voltage lead should be securely taped away from the chassis. The IF shield must be in place.

VIDEO IF ALIGNMENT

Set the contrast and brightness controls fully counter clockwise. Connect the negative lead of a 14 volt bias supply through 10KΩ to point A. Connect the positive lead to chassis. Set the channel selector to channel 4 position. Attenuate generator during alignment to maintain 4 volts peak to peak at point (B).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side of marker generator to point (C). Low side to chassis.	Not used	41.25MC (400∿ 20% Mod.)	4	Vert. Amp. thru 15KΩ to point (B). Low side to chassis.	A1	Adjust for MINIMUM 400∿ indication on scope.
2.	"	"	"	47.25MC	"	"	A2, A3	"
3.	"	"	"	45.0MC	"	"	A4	Adjust for maximum indication on scope.
4.	"	"	"	42.7MC	"	"	A5, A6	"
5.	"	"	"	45.5MC	"	"	A7	"
6.	"	"	"	44.0MC	"	"	A8	"
7.	Fig. 1	Across antenna terminals thru matching network (Fig. 1).	69MC (6MC Swp.)	67.25MC 70.25MC	"	"		Set fine tuning control at its mid-range position. Check for response curve similar to Fig. 2 for curve limits. If necessary, readjust A4 thru A8 for response limits as in Fig. 2. Adjust A4 for proper curve level. Adjust A8 to level curve top. Adjust A5 and A6 for proper slope of curve on low frequency side. Retouch adjustments only SLIGHTLY. If unable to obtain proper response curve, repeat steps A4 thru A8. DO NOT reset A1, A2 or A3.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (D) to chassis. The junction of these two resistors is alignment point (H) as shown on the schematic.
Remove 6DE6 (V3, 1st Video IF Tube) from its socket and set the volume control for normal volume.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	2200Ω	High side to point (B). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (D). Common to chassis.	A9, A10	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point (E). Common to point (H).	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V3 in its socket.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove the 6DE6 (V3, 1st Video IF Tube) from its socket.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	2200Ω Carbon Resistors	High side to point (B). Low side to chassis.	4.5MC (450KC Swp.)	4.5MC	Any	Vert. Amp. to point (D). Low side to chassis.	A9, A10	Disconnect stabilizing capacitor (C2). Increase generator output for useable pattern on scope. Adjust for cruve of maximum amplitude and symmetry similar to Fig. 3.
9.	"	"	"	"	"	Vert. Amp. to point (E). Low side to chassis.	A11	Reconnect C2. Adjust so that 4.5MC occurs at center of crossover lines as shown in Fig. 4. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines. Replace V3 in its socket.

4.5MC TRAP ALIGNMENT

Set the contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	2200Ω Carbon Resistors	High side to point (B). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to pin 11 of the picture tube. Common to chassis.	A12	Remove V3 from its socket. Adjust for MINIMUM deflection. Replace V3 in its socket.

ALTERNATE 4.5MC TRAP ADJUSTMENT

Turn on the set and tune in a TV station. Turn the fine tuning control clockwise until a 4.5MC beat pattern appears in the picture. Adjust A12 for MINIMUM 4.5MC beat in the picture.

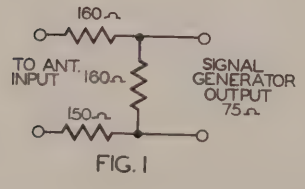


FIG. 1

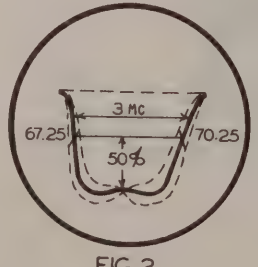


FIG. 2

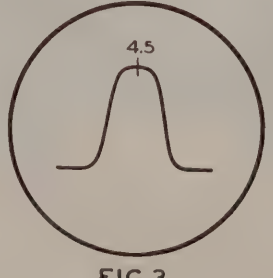


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Disconnect the white wire going to tuner AGC from main chassis. Connect the negative lead of a 1.5 volt bias battery to the loose end on the tuner. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	Not used	257MC	13	Vert. Amp. thru 1KΩ to point Ⓒ. Low side to chassis.	A13	Adjust for zero beat on scope. If regeneration occurs, increase bias to 3 volts if necessary.
				251MC	12		A14	
				245MC	11		A15	
				239MC	10		A16	
				233MC	9		A17	
				221MC	7		A18	
				129MC	6		A19	
				123MC	5		A20	Not in all sets.
				113MC	4		A21	
				107MC	3		A22	Not in all sets.
				101MC	2		A23	

RF AND MIXER ALIGNMENT

Connect the bias as in "Oscillator Alignment". Disconnect the tuner coupling link at the IF terminal strip near V3 and solder a 68Ω resistor across the open ends of the lead from the tuner. Remove V3 from its socket. Adjust the scope controls so that the width is double the height.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Fig. 1	Across antenna terminals thru matching network (Fig. 1).	213MC (10MC Swp.)	213MC	13	Vert. Amp. thru 1KΩ to point Ⓕ. Low side to chassis.	A24, A25	Check for response similar to Fig. 5. If response is not flat between limits shown, detune A25 counter clockwise until single peak appears. Adjust A24 until peak falls to 213MC marker. Adjust A25 for response similar to Fig. 5.
13.	"	"	177MC (10MC Swp.)	177MC	7	"	A26, A27	Check for response indicated by dotted lines in Fig. 6A and 6B. If necessary, adjust mirror image of original response curve, (tilt in opposite direction). If response curve appears as in Fig. 6A, adjust A26 and A27 until curve appears as Fig. 6B. This adjustment overcompensates to allow for channel 13 adjustment. Repeat steps 12 and 13 until centered and symmetrical response curves are obtained on channels 13 and 7.
14.	"	"	85MC (10MC Swp.)	85MC	6	"	A28, A29, A30	Adjust for symmetrical response at approximately the center of the bandpass. Adjust A29 counter clockwise until single peak appears. Adjust A28 until peak falls on 85MC marker. Adjust A30 for maximum curve amplitude and symmetry of single peak. Retouch SLIGHTLY, if necessary, A28 and A29 for symmetrical response centered at approximately the 85MC marker point similar to Fig. 5.
15.	"	"	44MC (10MC Swp.)	44MC	UHF Position	"	A28, A29, A30	Check response curve for symmetrical response centered at approximately 44MC. If necessary, retouch SLIGHTLY A28, A29 and A30 for symmetrical response centered at approximately the 44MC marker point. Repeat step 14 to be sure channel 6 is within proper limits on response curve similar to Fig. 5. Remove 68Ω resistor and reconnect IF coupling link. Remove bias supply and reconnect AGC lead to the tuner terminal.

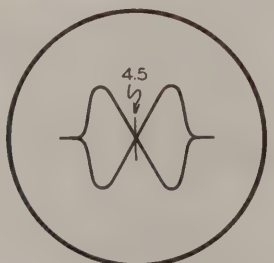


FIG.4

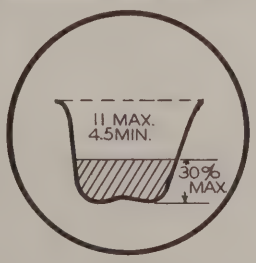
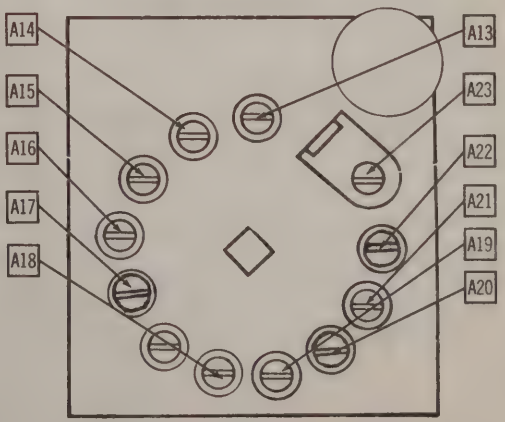


FIG.5

FIG. 6A

FIG. 6B

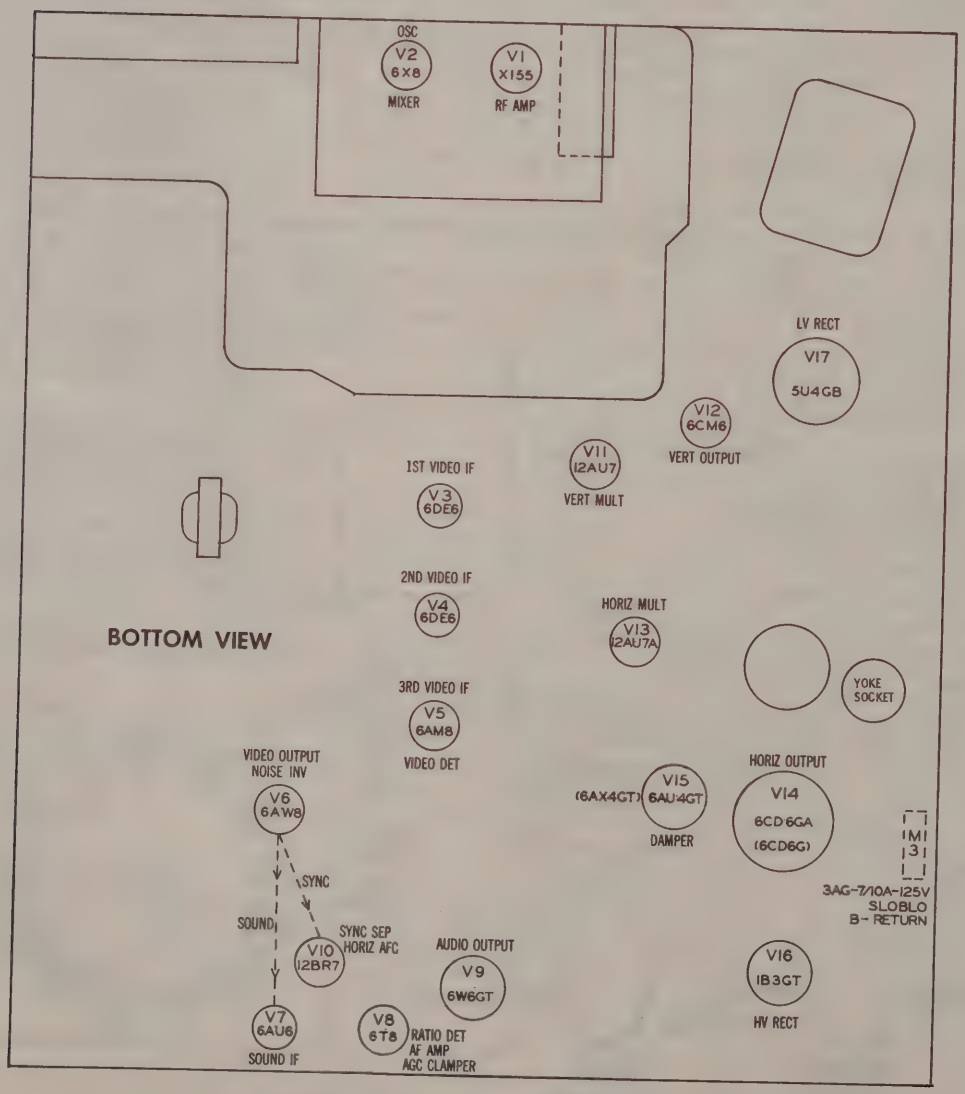


PHILCO MODEL S24D6018 (Ch. TV396), 24D6120L, M, 24D6122L, M (Ch. TV394)

RESISTANCE MEASUREMENTS

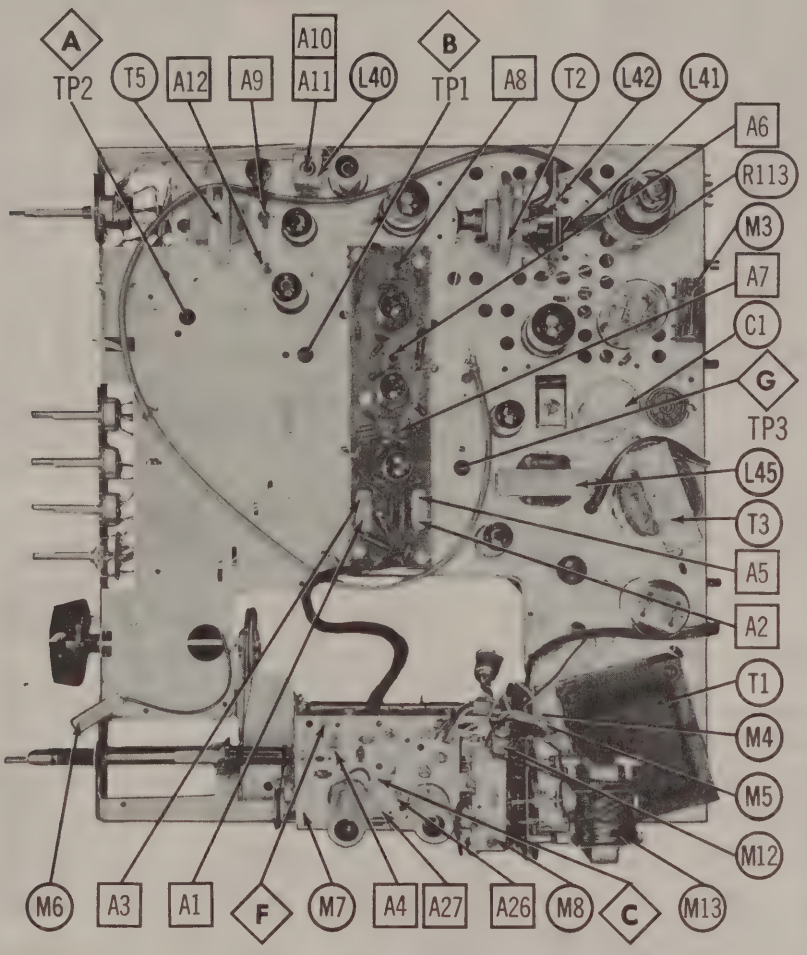
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	X155	† 2KΩ	230KΩ	INF	0Ω	. 1Ω	INF	3Meg	0Ω	0Ω
V 2	6X8	0Ω	† 22KΩ	47KΩ	0Ω	. 1Ω	0Ω	100KΩ	† 17KΩ	† 8. 5KΩ
V 3	6DE6	370KΩ	47Ω	0Ω	. 1Ω	■ 660Ω	■ 660Ω	0Ω		
V 4	6DE6	370KΩ	68Ω	0Ω	. 1Ω	■ 330Ω	■ 330Ω	0Ω		
V 5	6AM8	220Ω	. 1Ω	■ 1KΩ	. 1Ω	0Ω	■ 1KΩ	. 1Ω	3. 9KΩ	0Ω
V 6	6AW8	5KΩ	3. 5Meg	† 18KΩ	. 1Ω	0Ω	82Ω	400KΩ	11KΩ	† 5KΩ
V 7	6AU6	4. 2Ω	0Ω	0Ω	. 1Ω	■ 27KΩ	■ 27KΩ	330Ω		
V 8	6T8	300KΩ	22KΩ	300KΩ	0Ω	. 1Ω	3Meg	0Ω	3. 3Meg	† 270KΩ
V 9	6W6GT	TP	. 1Ω	† 240Ω	† 41Ω	1. 5Meg	TP	0Ω	■ 220Ω	
V 10	12BR7	† 150KΩ	1. 5Meg	0Ω	. 1Ω	. 1Ω	1Meg	0Ω	390KΩ	0Ω
V 11	12AU7	▲ 300KΩ	1Meg	680Ω	. 1Ω	. 1Ω	▲ 2. 5Meg	2. 5Meg	680Ω	0Ω
V 12	6CM6	† 340Ω	NC	2. 5Meg	. 1Ω	0Ω	2. 5Meg	300Ω	NC	† 700Ω
V 13	12AU7A	† 18KΩ	6Meg	1. 2KΩ	0Ω	0Ω	† 50KΩ	100KΩ	1. 2KΩ	. 1Ω
V 14	6CD6GA	TP	0Ω	0Ω	TP	1Meg	TP	. 1Ω	† 15KΩ	TOP CAP ▲ 23Ω
V 15	6AU4GT	NC	NC	130KΩ	NC	† 42Ω	NC	. 1Ω	0Ω	
V 16	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 935Ω
V 17	5U4GB	NC	25KΩ	NC	37Ω	NC	39Ω	NC	25KΩ	
V 18	24VP4A	0Ω	1Meg	PIN 10 ▲ 60KΩ	PIN 11 † 270KΩ	PIN 12 . 1Ω				

† MEASURED FROM PIN 2 OF V17.
■ MEASURED FROM 135V LINE.
▲ MEASURED FROM PIN 3 OF V15.
TP-TIE POINT.
NC-NO CONNECTION.

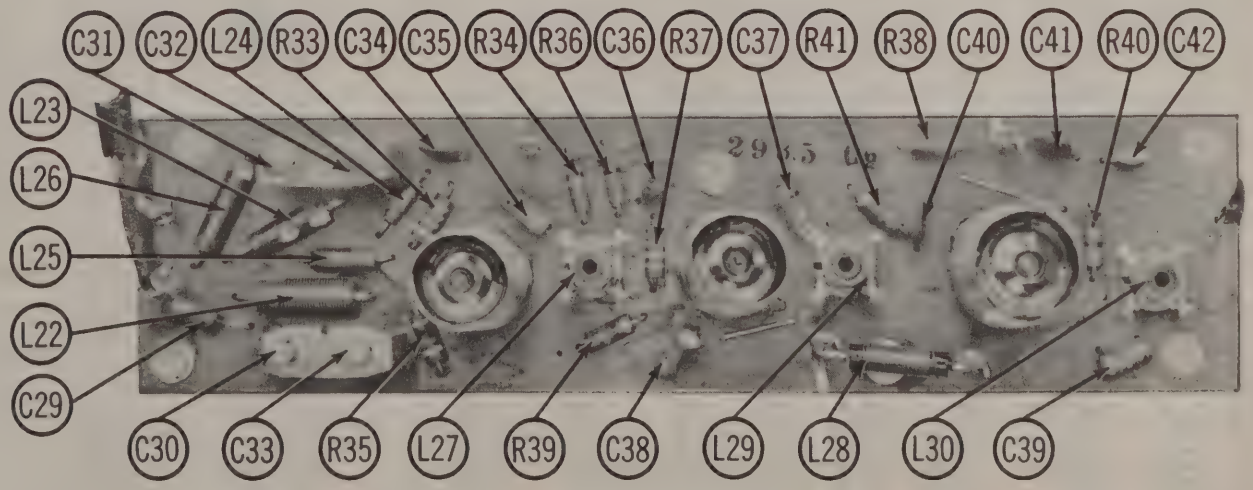


TUBE PLACEMENT CHART

TP1 .2V VIDEO DET. OUT
TP2 -.3V IF AGC
TP3 235V B+ HORIZ OSC



CHASSIS TOP VIEW



VIDEO IF SUB-CHASSIS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: PHILCO Part No.	STANDARD REPLACEMENT: Part No.	NOTES
V1	RF Amplifier	X155	X155	
V2	Mixer-Oscillator	6X8	6X8	
V3	1st Video IF Amplifier	6DE6	6DE6	
V4	2nd Video IF Amplifier	6DE6	6DE6	
V5	3rd Video IF Amplifier- Video Detector	6AM8	6AM8	
V6	Video Output, Noise Inverter	6AW8	6AW8	
V7	Sound IF Amplifier	6AU6	6AU6	
V8	Ratio Detector-AF Amplifier			
V9	AGC Clamper	6T8	6T8	
V10	Audio Output	6W6GT	6W6GT	
V10	Sync Separator-Horiz. AFC	12BR7	12BR7	
V11	Vert. Mult.	12AU7	12AU7	12AUTA may be used as an alternate
V13	Vert. Output	6CM8	6CM8	
V13	Horiz. Mult.	12AUTA	12AUTA	
V14	Horiz. Output	6CD6GA	6CD6GA	6CD6G may be used as an alternate
V15	Damper	6AU4GT	6AU4GT	6AX4GT may be used as an alternate
V16	HV Rectifier	1B3GT	1B3GT	
V17	LV Rectifier	5U4GB	5U4GB	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: PHILCO Part No.	CBS Part No.	GENERAL ELECTRIC Part No.	SYLVANIA Part No.	NOTES
V18	24VP4A ①	24VP4A ①		24VP4A ② 24VP4	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: PHILCO Part No.	AEROVOX Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No	SANGAMO Part No	SPRAGUE Part No.
C1A	40	400	30-2584-54	E4D849		FP333.2	TM-4U8	T-552	R3219 *
B	80	350				TC1265	TD-80-150	MT-25100	
C	100	300							
D	100	50							
C2	3	50	45-3035-4	PR550V2	BBR2-50T	TC302	TD-2-50	MT-0502	TVA-1301
C3A	20	150	30-2590-1	E3C622	D037	FP231.3	TM-2010-450	T-185	R2220 *
B	10	350			BR2050	TC83	TD-20-475	FM-4520	
C	20	475							

* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: PHILCO Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C4	33		62-0334090-11	NPO-S133	TCZ-3S	TZ18	NP0L-330	ZT-5433	5TCC-Q33	
C5	1000		30-1245-6	NPO-S1150	TCZ-15D	TZ34	NP0-334-151	ZT-5315	5TCC-T15	
C6	150		62-1150010-01	NPO-S1150	TCZ-15D	TZ34	NP0-334-151	ZT-5315	5TCC-T15	
C7	5-3		31-6530-3		TCZ-5D	TZ06	311S-01-0R5	CT565A		
C9	220		62-1220010-11	NPO-S1220	TCZ-22D	TZ36	311-521	UC-5322	5TCC-T22	
C10	150		62-1150010-01	BPD-00015	DD-151	G046	311-151	ZT-5315	5GA-T15	
C11	39									
C12	27		30-1234-126		TCZ-2T	TZ16	NP0L-270			
C13	15			NPO-S115	TCZ-15	TZ01	NP0K-150		5TCC-Q15	
C14	3.3		30-1224-103	NPO-S13.3	TCZ-3R3	TZ06	NP0A-3R3	ZT-5533	5TCC-P-V22	
C15	1.3									
C16	5-3		31-6520-3			S39-3	3139-01-0R5	CT565A		
C17	1.5		30-1224-127							
C18	2.2		30-1231-8	NPO-S22.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C20	12		30-1255				N330K-120			
C21	12		30-1255				N330K-120			
C22	220		62-1220010-11	S1220	D6-221	TP39	311-221	UC-5322	5GA-T22	
C23	1000		30-1245-6							
C24	10000		30-1238-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-B1	
C25	680		62-1680010-01	S1680	D6-681	TP50	811-681	UC-5368	5GA-T68	
C26	1500		30-1238-15	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C27	680		62-1680010-01	S1680	D6-681	TP50	811-681	UC-5368	5GA-T68	
C28	27		30-1234-126		TCZ-2T	TZ16	NP0L-270			
C29	680		62-1680010-01	S1680	D6-681	TP50	811-681	UC-5368	5GA-T68	
C30	1500		30-1238-15	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C31	1500		30-1238-15	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C32	5		30-1234-28	NPO-D5	DI-0000005	C001	NP0A-050	ZT-5505	5GA-V5	
C33	047	200	30-4650-45	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C34	.0047	200		BPD-0047	D6-472	CUB6D47	GP2-133-472	PT6247	5TM-D47	
C35	680		62-0684090-11	BPD-0368	D6-680	TZ25	801-680		5TCC-Q68	
C36	68		62-0684090-01	NPO-S168	D6-680	TZ26	801-680		5TCC-Q68	
C37	.1	400	30-4650-47	P488N-1	DF-104	CUB4P1		PT4101	4TM-P1	
C38	047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C39	.033	400		BPD-03	DF-203	CUB4S23	817-03	PT4123	4TM-S23	
C40	680		62-1680010-01	S1680	D6-681	TP50	811-681	UC-5368	5GA-T68	
C41	1000		30-1238-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	3000		30-1238-4	BPD-003	DD-302	K076	811-003	UC-523	5GA-D3	
C43	470		62-1470010-01	S1470	D6-471	TP45	811-471	UC-5347	5GA-T47	
C44	.1	200	30-4650-47	P288N-1	DF-104	CUB2P1		PT4101	2TM-P1	
C45	10000		30-1238-2	BPD-01	DD-103	K082	811-01	DC-521	5HK-B1	
C46	2.2		30-1231-6	NPO-S22.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C47	18		62-0183000-01	S18	D6-180	G033	831-180	UC-5418	5GA-Q18	
C48	3000		30-1238-16		DD-302	K076	811-003	UC-523	5GA-D3	
C49	5000		30-1238-1	BPD-005	DD-502	K080	811-005	DC-523	5HK-D5	
C50	1500		30-1238	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C51	.0033	200	30-4650-55	BPD-0033	D6-332	CUB6D33	GP2-133-332	PT6233	6TM-D33	
C52	023	300	30-1236-2	BPD-02	DF-303	CUB2S23	817-02	PT4123	2TM-S23	Note 1
C53	5000		30-1238-1	BPD-005	DD-502	K080	811-005	DC-535	5HK-D5	
C54	3300		30-1238-17	BPD-0033	D6-332	K077	811-0033	UC-5233	5HK-D33	
C55	023	600	30-1650-51	BPD-02	DF-203	CUB6S23	817-02	PT6123	6TM-S23	
C56	180		62-1150010-01	S1180	D6-181	TP36	GP2K-151	UC-5318	5GA-T18	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: PHILCO Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C67A	4000		} 30-8008-1	†PA-367-2	D6-402	K078	811-004	UC-5240	5HK-D4	
B	10000				DD-103	K082	811-01	DC-511	5HK-S1	
C	10000				DD-103	K082	811-01	DC-511	5HK-S1	
C68	022	200	30-4650-43	BPD-02	DF-203	CUB2S22	817-02	PT4122	2TM-S22	
C69	033	200	30-4650-44	BPD-03	DF-303	CUB2S33		PT4133	2TM-S33	
C70	.0033	400	30-4650-55	BPD-0033	D6-332	CUB6D33	GP2-133-332	PT6233	6TM-D33	
C71	10000	500	30-4650-58	BPD-01	DD-103	CUB6S3	811-01	PT611	6TM-S1	
C72	033	400	30-4650-61	BPD-03	DF-303	CUB6S33		PT6133	6TM-S33	
C73	.1	400	30-4650-64	P488N-1	DF-104	CUB4P1		PT4101	4TM-P1	
C74	.047	400	30-4650-52	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C75	68		62-0684090-01	NP0-S168	D6-680	TP33	801-680		5GA-Q68	
C76	130	500	30-1012S237	NP0-S1120	TCZ-120	22R5T12	811-121		5TCC-T12	
C77A	1000		30-1239-14	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
B	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C78A	40		30-8008-3	†PA-366-4						
B	14000									
C79	2200		60-20225434	M54-0022		1RS222			M5-222	
C80	82		30-6082S437	1469-0008S2	D6-820	TZ28	801-820		M5-482	
C81	390		60-10395437	1469-0003S9	D6-391	5RS739	811-391		M5-339	
C82	390	500	30-1039S417	1469-0003S9	D6-391	5RS739	811-391		M5-339	
C83	5000		30-1238-1	BPD-005	DD-502	K080	811-005	DC-535	5HK-D5	
C84	1000		30-1238-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C85	7.5		30-1234-37							
C86	10000		30-1238-2	BPD-01	DD-103	K082	811-01	DC-521	5HK-B1	
C87	033	600	30-4650-51	BPD-03	DF-303	CUB6S33		PT6133	6TM-S33	
C88	68	4000	30-1248-4							
C89	10000	600	30-4650-58	BPD-01	DD-103	K082	811-01	PT611	10HK-S1	
C90	10000	600	30-4650-58	BPD-01	DD-103	K082	811-01	PT611	10HK-S1	

† Items C87A, C87B, C87C, R80A, R80C and R80D are combined in one unit.
* Items C78A, C78B, R96A and R96B are combined in one unit.
Note 1. Some versions may use a .01MFD unit (part #30-1236-2) in this application.

CONTROLS

ITEM No	RATING: RESIST OHMS	WATTS	REPLACEMENT DATA: PHILCO Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	15KΩ	½	33-5573-12		RTV-582	* QJ-1002	UE780	Contrast-Tapped at 7K (Panel)
B	250KΩ	½						Volume tapped at 125K (Rear)
R1A	15KΩ	½	33-5573		RTV-513	* QJ-642	UE780S	Contrast tapped at 10K (Panel)
B	250KΩ	½						Volume & Switch tapped at 160K-Note 2 (Rear)
R2A	100KΩ	½	33-5572-16	B-40	A47-100K-S	QU1-128	TA15L	Brightness
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.
R3A	3Meg	½	33-5573-14	B-34	A47-3Meg-S	QU1-160	TA36L	Vert. Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A.
R4A	50KΩ	½	33-5572-8	B-31	A47-50K-S	QU1-123	TA54L	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R4A.
R5	12.5Ω	2	33-5574			WPK-12500		Width - Wire Wound
R6A	2.5Meg	½	33-5572-1	BX-83	A47-2.5Meg-S	QU1-239	TA25L	Height
B	Shaft		Not Req.	Not Req.	FKS-1	RQ	Not Req.	Attach to R6A.
R7A	1500Ω	½	33-5572-13		A47-1500-S	QU1-109	TA152L	Vert. Linearity-Note 1
B	Shaft		Not Req.		FKS-1A	Not Req.	Not Req.	Attach to R7A.
R8A	250KΩ	½	33-5572	AB-50	A47-230K-S	QU1-150	TA254L	Horiz. Oscillator
B	Shaft		Not Req.	AK-1	FKS-1	RQ	Not Req.	Attach to R8A.

Note 1. Some versions will use an alternate control Part No. 33-5565-80 in this application.
Note 2. Used in Chassis TV396 only.
* Concentrikit Equivalent: K-8 Kit, Base Elements & Shafts; B13-18X & P13-12S (Panel) B13-19OX & B1-S12 (Rear) 76-1 (Switch).
* Concentrikit Equivalent: K-8 Kit, Base Elements & Shafts; B13-18X & P13-12S (Panel) B13-19X & R1-S09 (Rear).

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: PHILCO Part No.	IRC Part No.	NOTES
R9	470KΩ	½	66-4478340	BTS-470K	
R10	22KΩ	½	66-2228340	BTS-22K	
R11	470KΩ 5%	½	66-4478340	BTS-470K	
R12	470KΩ 5%	½	66-4478340	BTS-470K	
R13	180Ω	½		BTA-180	
R14	82Ω	½	66-1688340	BTS-680	
R15	22KΩ	½	66-2228340	BTS-22K	
R16	2700Ω	½	66-2278340	BTS-2700	
R17	220Ω	½	66-1228340	BTS-220	
R18	1500Ω	½	66-2158340	BTS-1500	
R19	100KΩ	½	66-4108340	BTS-100K	
R20	330Ω	½	66-2328340	BTS-0300	
R21	8200Ω	2	66-2825340	BTH-8200	
R22	220Ω	½	66-1228340	BTS-220	
R23	47KΩ	½	66-2478340	BTA-47K	
R24	150KΩ	½	66-4158340	BTS-150K	
R25	2.2Meg	½	66-5228340	BTS-2.2Meg	
R26	1.33Meg 5%	½	66-5128240	BTS-1.33Meg%	
R27	1.5Meg	½		BTS-1.5Meg	Note 1
R28	6.23Meg 5%	½		BTS-6.23Meg%	Note 2
R29	15Meg	½	66-6158340	BTS-15Meg	Note 3
R30	8.2Meg	½	66-5828340	BTS-8.2Meg	
R31	47KΩ	½	66-2478340	BTS-47K	
R32	390KΩ	½		BTS-390K	Note 4
R33	47KΩ	½	66-2478340		
R34	330Ω	½	66-1338340	BTS-330	
R35	47Ω	½	66-0478340	BTS-47	
R36	1000Ω	½	66-2108340	BTS-1000	
R37	18KΩ	½	66-3188340		
R38	330Ω	½	66-1338340	BTS-330	
R39	82Ω	½	66-0568340	BTS-68	
R40	100Ω	½	66-2106340	BTS-1000	
R41	330Ω	½	66-1328340	BTS-330	
R42	3900Ω	½	66-2398340	BTS-3900	
R43	3900Ω	½	66-2398340	BTS-3900	
R44	470KΩ	½	66-4478340	BTS-470K	
R46	470KΩ	½	66-4478340	BTS-470K	
R46	5.3Meg	½	66-5338340	BTS-5.3Meg	
R47	82Ω	½	66-0828340	BTS-82	
R48	120Ω	1	66-2124340	BTA-1200	
R49	5800Ω	7	33-1335-154		
R50	22KΩ	½	66-2225340	BTS-22K	
R51	2200Ω	½	66-2228340	BTS-2200	
R52	150KΩ	½	66-4158340	BTS-150K	
R53	22KΩ	½	66-2228340	BTS-22K	
R54	5600Ω	½	66-2885340	BTS-5600	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: PHILCO Part No.	IRC Part No.	NOTES
R55	1Meg	½	66-5108340	BTS-1Meg	
R56	270KΩ	½	66-4278340	BTS-270K	
R57	330Ω	½	66-1338340	BTS-330	
R58	22KΩ	½	66-2228340	BTS-22K	
R59	390Ω	½	66-1398340	BTS-390	
R60	47KΩ	½	66-4478340	BTS-47K	
R61	68KΩ	½	66-4688340	BTS-68K	
R62	5.3Meg	½	66-5338340	BTS-5.3Meg	
R63	270KΩ	½	66-4278340	BTS-270K	
R64	100KΩ	½	66-4108340	BTS-100K	
R65	1.5Meg	½	66-5158340	BTS-1.5Meg	
R66	3KΩ	½	66-1308340	BTS-3K	
R67	220Ω	½	66-1228340	BTA-220	
R68	4.7Meg	½		BTS-4.7Meg	Note 5
R69	2.2Meg	½	66-5228340	BTS-2.2Meg	
R70	220KΩ	½	66-4228340	BTS-220K	
R71	6.8Meg	½		BTS-6.8Meg	Note 6
R72	15KΩ	½	66-3158340	BTS-15K	
R73	33KΩ	½	66-3328340	BTA-33K	
R74	56000Ω 5%	½	66-2566240	BTS-5600 5%	
R75	10Meg	½		BTS-10Meg	Note 3
R76	150KΩ	½	66-4158340	BTS-150K	
R77	820KΩ	½	66-4828340	BTS-820K	
R78	27KΩ	½	66-3278340	BTS-27K	
R79	330KΩ	½	66-4338340	BTS-330K	
R80A	10KΩ			BTS-10K	
B	10KΩ	½	† 30-8008-1	BTS-10K	
C	2000Ω	½		BTS-2K	
D	1Meg			BTS-1Meg	
R81	220KΩ	1	66-4224340	BTA-220K	
R82	6800 5%	½	66-1688240	BTS-680 5%	
R83	3.3Meg	½	66-5188340	BTS-3.3Meg	
R84	(1)(2)(3)				
	65° C		33-1343-7		Note 7
	150KΩ ④				
	25° C				
R85	470KΩ	½	66-4478340	BTS-470K	
R86	820KΩ	½		BTS-820K	Note 8
R87	10KΩ	½	66-3108340	BTS-10K	
R88	2.2Meg	½	66-5228340	BTS-2.2Meg	
R89	27KΩ	½	66-3278340	BTA-27K	
R90	27KΩ	½	66-3278340	BTA-27K	
R91	150Ω	½	66-1158340	BTS-150	
R92	1000Ω	½			
R93	8000Ω	½			
R94	390KΩ	½	66-4398340		

RESISTORS (cont)

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: PHILCO Part No.	IRC Part No.	NOTES
R95	680KΩ	½	66-4688340		
R96A	4.7Meg	½	* 30-8009-3		
B	220KΩ	½			
R97	68KΩ	½	66-3688340		
R98	15KΩ	½	66-3154340		
R99	120Ω	½	66-2128340		
R100	56KΩ	½	66-3568340		
R101	8200Ω	½	66-2828340	BTS-8200	
R102	39KΩ	½	66-3398340	BTS-39K	
R103	6.7Ω	½	66-0178340	BTS-10K	
R104	3300Ω	½	66-2338340	BTS-3300	

Note 1. Some versions use a 1Meg ½W resistor in this application (Part No. 66-5108340).
Note 2. Some versions use a 5.6Meg ½W 5% resistor in this application (Part No. 66-5568240).
Note 3. Not used in some versions.
Note 4. Some versions use a 220K ½W resistor in this application (Part No. 66-4228340).
Note 5. Some versions use a 2 2Meg ½W resistor in this application (Part No. 66-5228340).
Note 6. Some versions use a 5.6Meg ½W resistor in this application (Part No. 66-5568340).
Note 7. Temperature compensating resistor.
Note 8 Some versions use a 470KΩ ½W resistor in this application (Part No. 66-4478340).
† Items R80A, R80B, R80C, R80D, C67A, C67B, C67C are combined in one unit
* Items R96A, R96B, C78A, C78B are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: PHILCO Part No	Halldorson Part No	Merit Part No	Thordarson Part No	Triad Part No
T1	117VAC	630VCT	5V	12.6V	32-8719				
	@ 1.75A	@ .265A	@ 5A						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: PHILCO Part No	Halldorson Part No	Merit Part No	Ram Part No	Stancor Part No	Thordarson Part No	Triad Part No
T2	Horiz. Output Trans.	32-8866-3	FB41B * ③	HVO-36 * ③	235T1 * ③	X094 * ③	A-8253 * ③	FLY-16 * ③	D-50 * ③
		32-8866-2 ①	FB41B * ②	HVO-36 * ②	235T1 * ②	X094 * ②	A-8253 * ②	FLY-16 * ②	D-50 * ②
T3	Vert. Output Trans.	32-8712							
T4A	Yoke(90°)Horiz.(31MH)	32-9889-1 ③						Y-15 ③ ⑤	
B	Vert.(46MH)								

① Alternate Philco part number.
② Drill new mounting hole(s).
③ Includes resistors R92 and R93.
④ Use original core clamp.
⑤ Connect original yoke damping network if necessary.
⑥ Connect horizontal yoke terminal #3 to yoke plug Pin #5; yoke #2 or #7-to plug #3; Yoke #1 to plug #8.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
12	9	9	9	8	8	8	8
3	7	7	7	7	1	7	7
6	N.C. See Note ⑦	N.C. See Note ⑦	N.C. See Note ⑦	N.C. See Note ⑦	N.C. See Note ⑦	N.C. See Note ⑦	N.C. See Note ⑦
1	1	1	1	1	4	1	1
7	6	6	N.C.	3	7	N.C.	N.C.
8	2	2	N.C.	6	6	N.C.	N.C.
Special Note:	⑦	⑦	⑦	⑦	⑦	⑦	⑦

⑦ Connect R109 in series with C88 (adjust value if necessary) across horizontal yoke terminals #1 and #2 (yoke socket Pins #5 and #3).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATINGS: IMPEDANCE PRI.	SEC.	REPLACEMENT DATA: PHILCO Part No	Halldorson Part No	Merit Part No	Stancor Part No	Thordarson Part No	Triad Part No.	NOTES
T5	2.6KΩ	3-4Ω	32-8718						

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: PHILCO Part No	QUAM Part No	RCA TYPE No	NOTES
SP1	6½"	PM	3-4Ω	36-1833-4	8A1	229R1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI	DC RES. SEC	REPLACEMENT DATA: PHILCO Part No	MEISSNER Part No	MERIT Part No.	MILLER Part No.	NOTES
L1	VHF Ant.							
	Matching Trans	.7Ω	.7Ω	33-4432-3				
L2	VHF Ant.							
	Matching Trans	.7Ω	.7Ω	33-4432-3				
L3	IF Trap	.1Ω						Wound On 22MMF Cap
L4	VHF IF Coil	0Ω						
L5	UHF IF Coil	0Ω						
L6	VHF Ant. Coil	0Ω						Channel 13,
L7	VHF Ant. Coil	0Ω						
L8	VHF Ant. Coil	0Ω						Channel 6.
L9	Next. Coil	0Ω						
L10	VHF RF Coil	0Ω						Channel 13.
L11	VHF RF Coils	0Ω						
L12	VHF RF Coil	0Ω						Channel 6.
L13	UHF IF Coil	0Ω						
L14	VHF Mixer Grid Coil	0Ω						Channel 13
L15	VHF Mixer Grid Coils	0Ω						
L16	VHF Mixer Grid Coil	0Ω						Channel 6.
L17	UHF IF Coil	0Ω						
L18	VHF Osc. Coil	0Ω						

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L19	VHF Osc. Coils	0Ω		328-0059*				*Later Production Part #328-0065 - Tuner #76-8946-11.
L20	RF Coil	0Ω						
L21	Conv. Plate	.1Ω		32-4359-16				Tapped
L22	47.25MC Trap	.1Ω		32-4645-3	19-1002		4606	2.4 Microhenries.
L23	47.25MC Trap	.3Ω		32-4645-1				2.7 Microhenries.
L24	41.25MC Trap	0Ω		32-4645-4	19-1000		4602	1.1 Microhenries.
L25	RF Coil	.1Ω		32-4645-2				1.85 Microhenries.
L26	1st. Video IF	.4Ω		32-4645	19-1003		4608	3.7 Microhenries.
L27	2nd. Video IF	.1Ω	.1Ω	32-4644				
L28	Fil. Choke	.1Ω		32-4112-49				3 Microhenries.
L29	3rd. Video IF	.1Ω	.1Ω	32-4644-1				
L30	4th. Video IF	.1Ω	.1Ω	32-4644-2				
L31	RF Coil	1.2Ω		32-4646				3 Microhenries.
L32	Peaking Coil Series	1.2Ω		32-4674	19-6022		6152	22 Microhenries.
L33	Peaking Coil Shunt	1.2Ω		32-4112-52				3 Microhenries.
L34	Peaking Coil Series	6Ω		32-4480-4	19-3250	TV-185	6181	250 Microhenries.
L35	Peaking Coil Series	6Ω		32-4480-18	19-3160	TV-184	4644	150 Microhenries.
L36	4.5MC Trap	1.3Ω		32-4463-11				
L37	Peaking Coil Series	6Ω		32-4480-4	19-3250	TV-185	6181	250 Microhenries.
L38	Peaking Coil Series	6Ω		32-4480-4	19-3250	TV-185	6181	250 Microhenries.
L39	Sound IF	4.2Ω		32-4463-14				
L40	Ratio Det.	8Ω	1Ω CT	32-4631-1A	17-3497	TV-115	6205	Tertiary Winding - 1.3Ω.
L41	RF Choke	2.2Ω		32-4112-50	19-1006		4624	15 Microhenries.
L42	RF Choke	2.2Ω		32-4112-50	19-1006		4624	15 Microhenries.
L43	RF Choke	1.8Ω		32-4112-50	19-1006		4624	15 Microhenries.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L44	160Ω		32-4557-4							

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L45	.265A	41Ω	1.3HY	32-8710	C5037 ①			26C44	C-23X

① Drill one new mounting hole.

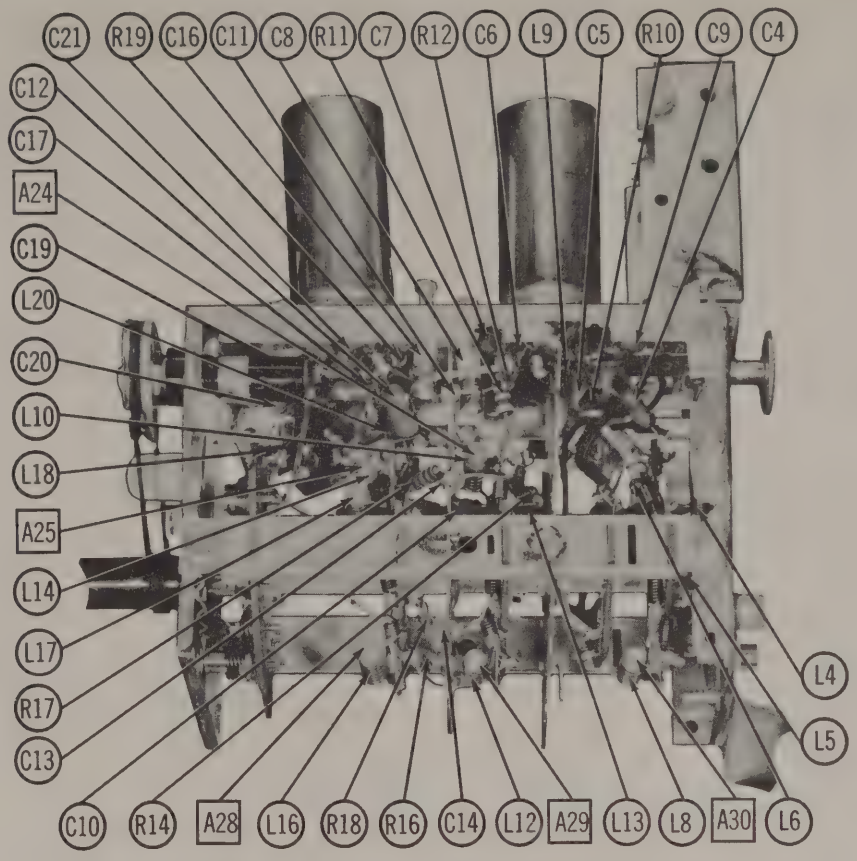
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA PHILCO PART No. FUSE	PHILCO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	1" Piece #26 Wire							
M2	1" Piece #26 Wire							
M3	3AG S/B	7/10A 125V	AD-2246-15	76-4519-2	313.700 (3AG S/B 7/10A)	357001	MDL 7/10	4405
M4	1" Piece #26 Wire							
M5	1" Piece #26 Wire							

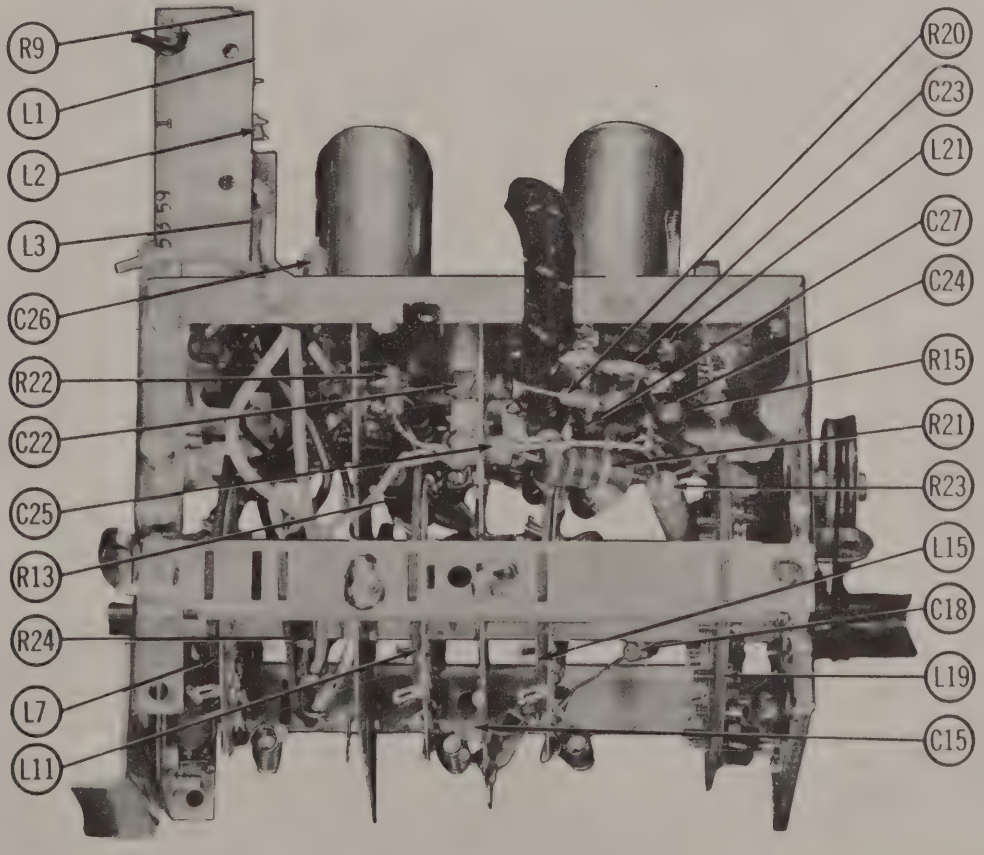
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M6	Dial Light	3463-4	#1347
M7	Tuner	76-8946-8*	VHF (T-37B) Chassis TV-394.
	Tuner	76-8946-9	VHF (T-37A-1) Chassis TV-396.
M8	Ant. Matching Network	76-9204	Includes L1, L2, L3, & R9; Used With Tuner Part #76-8946-8 Or 76-8946-9.
	Ant. Matching Network	76-9998	Used With Tuner Part #76-8946-11.
M9	Switch	42-2047	Range (Rotary, Wafer Type).
M10	Switch	42-2053-1	On-Off (Power) - SPST; Chassis TV-394 Only.
M11	Switch	76-9739	Micro - Stepper, Automatic Tuning - Chassis TV-394 Only.
M12	Switch	42-2051	"Hold" - Stepper, Automatic Tuning - Chassis TV-394 Only.
M13	Motor	41-2055	Stepper, Automatic Tuning - Chassis TV-394 Only.
M14	Focus Magnet	76-9511-2	Includes Centering Device - Model 24D6120M.
	Focus Magnet	76-9014-2	Includes Centering Device - Models 24D6018, 24D6120L, 24D6122L, 24D6122M.
M15	Ion Trap	76-6077-4	
M16	Correction Magnet	76-8474-1	
	Cabinet	11112502	Model 24D6018
	Cabinet	11125-3	Light (Metal) - Model 24D6120L.
	Cabinet	11125-1	Light (Wood) - Model 24D6120L.
	Cabinet	11153-1	Model 2406120M.
	Cabinet	11128-1	Model 24D6122L.
	Cabinet	11128	Model 24D6122M.
	Mask	54-9033-11	Models 24D6018, 24D6120M.
	Mask	54-9033-12	Models 24D6120L, 24D6122L, 24D6122M.
	Safety Glass	54-9213-61	

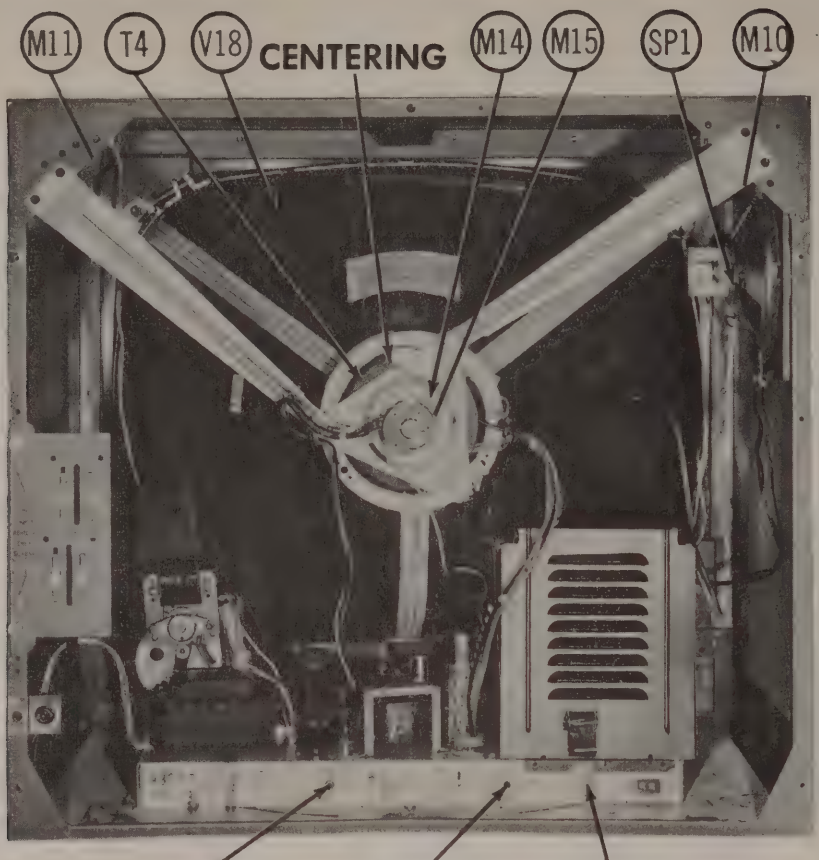
* Alternate Part #76-8946-11 (T-37B-1).



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a TV station, preferably with a test pattern. Reduce the picture width until approximately one inch of blank screen appears on each side of the picture.

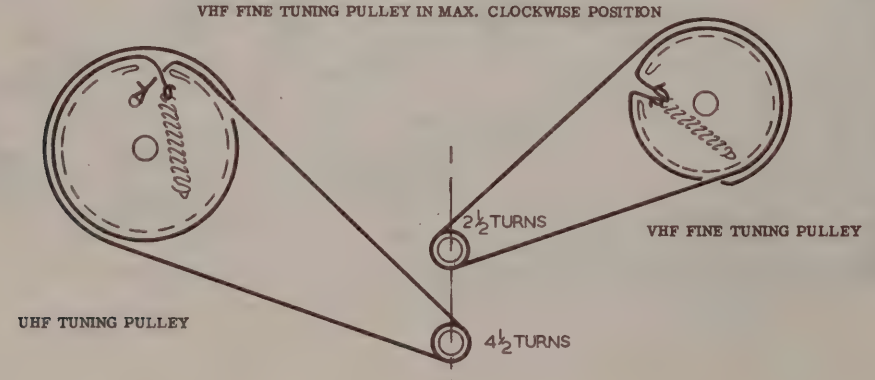
Increase the brightness control setting until the blanking becomes visable indicated by a black bar at each side of the picture. Connect a .1MFD capacitor from point (G) to chassis.

Set the horizontal hold control at the center of its range. Adjust the horizontal oscillator control (R8) until the picture is centered between the blanking bars.

Remove the .1MFD capacitor.

Adjust the horizontal frequency coil slug (B1) until the picture is again centered between the two blanking bars. Rotate the horizontal hold control slowly thru its range. The picture should lose sync at both extremes of rotation. If it does not, readjust the horizontal oscillator control (R8) until that condition is obtained. Check the number of diagonal bars on either side of the pull-in range of the horizontal hold control. There should be one or two bars present. If proper pull-in is not obtained, repeat the above procedure.

Adjust the horizontal width control for a picture slightly wider than necessary to fill the picture mask horizontally.



FINE TUNING DRIVE CORD STRINGING

SENTINEL
MODEL 1U-360

SENTINEL
MODEL 1U-360

TRADE NAME	Sentinel Model 1U-360
MANUFACTURER	Sentinel Radio Corp., 2100 W. Dempster, Evanston, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Four)	Types 12AU6 Converter, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .22 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.02MFD	High side to antenna lug on tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce modulation.
2.	"	"	1625KC	"	"	A3	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

SENTINEL
Model 1U-360

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		SENTINEL PART No.	STANDARD REPLACEMENT	
V1	Converter	12AU6	12AU6	
V2	Det. - AF Amplifier	12AV6	12AV6	
V3	Output	50C5	50C5	
V4	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SENTINEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	25E83	PRS150V50-3020	BBRT5315C	TC3107	TDL-532	FMT-327	TVA-3430
B	20	150							
C	20	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	47		23E4000-13	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C3A	220									
B	5000									
C	5000		♦23E2041-6	♦PA-113-2	♦PC-151	♦116TM2	♦1408-02		♦DT-2	
D	250									
E										
C4	10000		23E4004-17	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C5	.047	400	23E3414	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C6	.1	400	23E3416	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	

♦ Items C3A, C3B, C3C, C3D, C3E, R3A, R3B and R3C are combined in one unit. When replacing items separately, C3D and C3E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SENTINEL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	28E121	AB-76	A47-2Meg-Z	Q13-139	U-55	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A

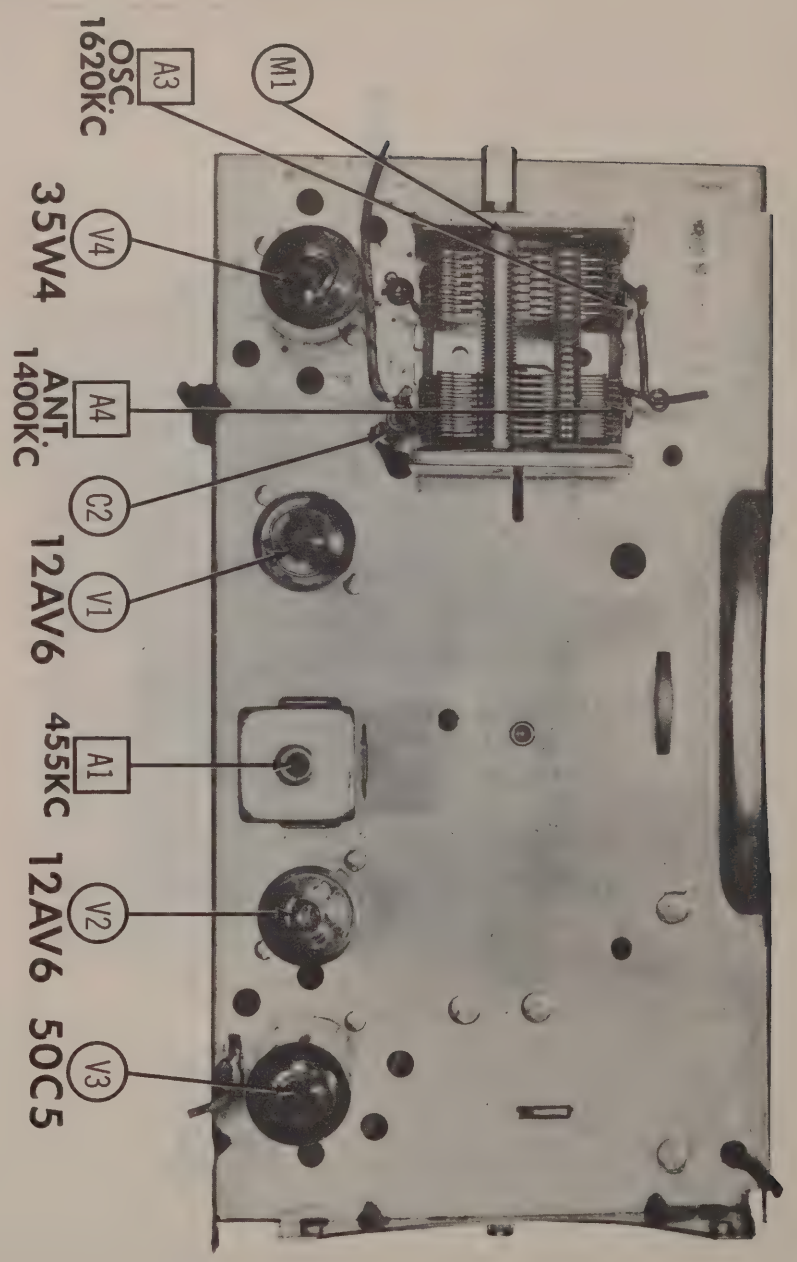
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SENTINEL PART No.	IRC PART No.	
R2	2.2Meg	½	27E225M½	BTS-2.2Meg	
R3A	6.8Meg			BTS-6.8Meg	
B	470KΩ		♦23E2041-6	BTS-470K	
C	470KΩ			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SENTINEL PART No.	IRC PART No.	
R4	150Ω	½	27E151K½	BTS-150	
R5	2200Ω	½	27E222K½	BTS-2200	
R6	33Ω	1	27E330K-1	BTA-33	
R7	68Ω	2	27E680K-2		

♦ Items R3A, R3B, R3C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SENTINEL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.7KΩ	3.1Ω	22E88	Z1101	A3025	A3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SENTINEL PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3.1Ω	1E63	4A07	223S1	

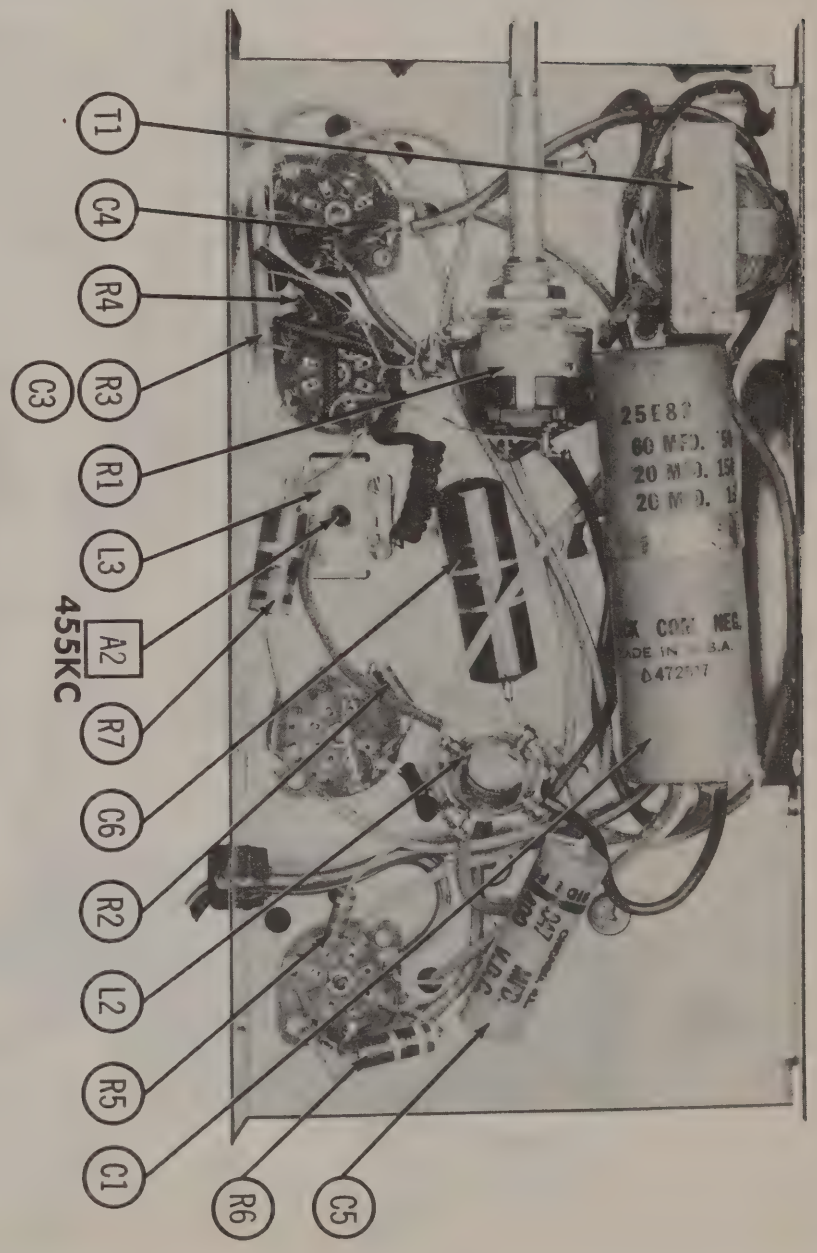
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SENTINEL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.9Ω		64E67-3				Includes cabinet back
L2	Osc. Coil	1Ω	7.8Ω	20E1011				Tertiary winding-1.6Ω
L3	IF Trans.	31Ω*	31Ω	20E1010				* Tapped @ 1.1Ω

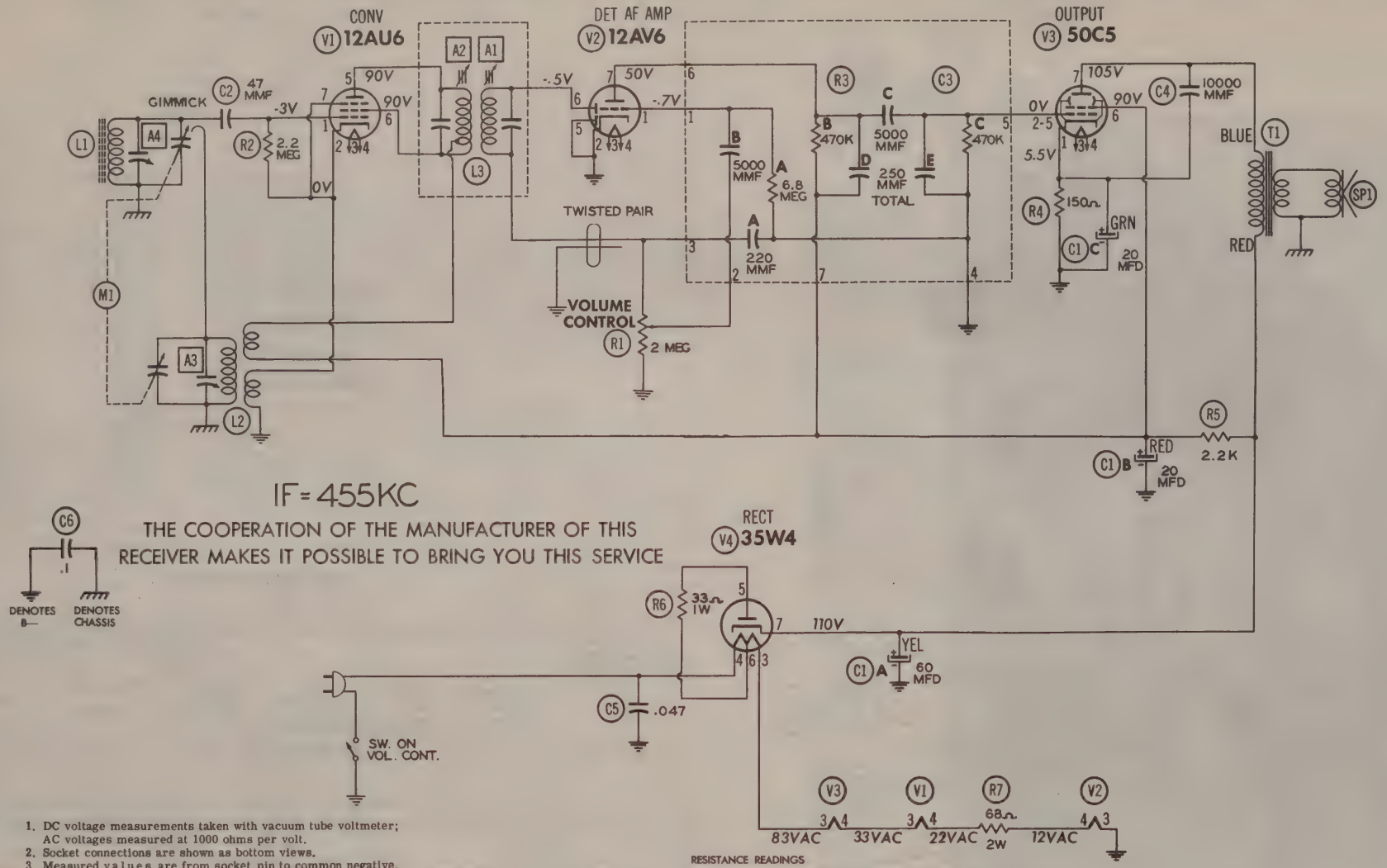
MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M1	Tuning Cap.	24E68	2 Gang (15-230MMF, 13-105MMF)
	Cabinet	7E464-9	Black
	Cabinet	7E464-10	Green
	Cabinet	7E464-11	Tan
	Cabinet	7E464-12	Ivory
	Cabinet	7E464-13	Mahogany
	Cabinet	7E464-14	Red
	Cabinet	7E464-15	Rust
	Cabinet	7E464-16	Yellow
	Knob	35E37-14	Station selector - black
	Knob	35E37-15	Station selector - green
	Knob	35E37-16	Station selector - tan
	Knob	35E37-17	Station selector - ivory
	Knob	35E37-18	Station selector - mahogany
	Knob	35E37-19	Station selector - red
	Knob	35E37-20	Station selector - rust
	Knob	35E37-21	Station selector - yellow
	Knob	37E47-19	Volume - black
	Knob	37E47-20	Volume - green
	Knob	37E47-21	Volume - tan
	Knob	37E47-22	Volume - Ivory
	Knob	37E47-12	Volume - mahogany
	Knob	37E47-14	Volume - red
	Knob	37E47-25	Volume - rust
	Knob	37E47-26	Volume - yellow

CHASSIS—BOTTOM VIEW



SENTINEL Model IU-360



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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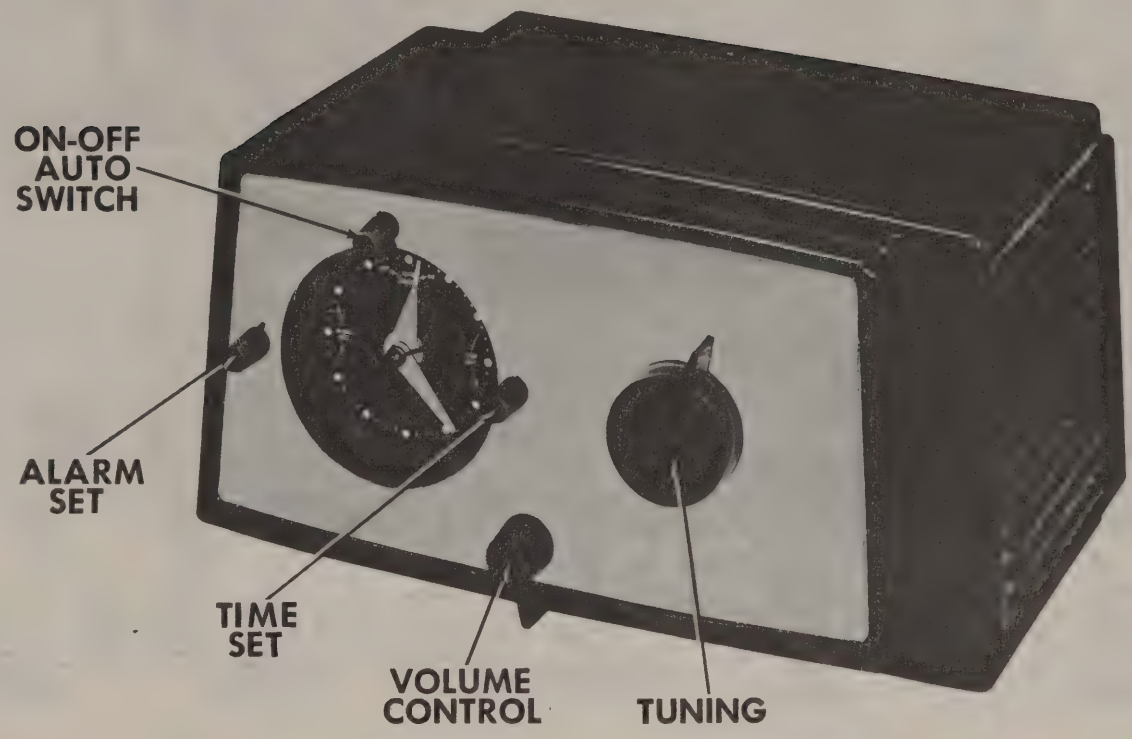
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	2.2Meg	1Ω	92Ω	80Ω	†2.2KΩ	†2.2KΩ	1Ω
V 2	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	2Meg	†472KΩ
V 3	50C5	150Ω	470KΩ	142Ω	92Ω	470KΩ	†2.2KΩ	†220Ω
V 4	35W4	NC	NC	142Ω	177Ω	200Ω	170Ω	80KΩ

† MEASURED FROM PIN 7 OF V4.
NC - NO CONNECTION.

SILVERTONE MODEL 6018
(Ch. 757.20000)



SILVERTONE MODEL 6018
(Ch. 757.20000)

TRADE NAME	Silvertone Model 6018 (Ch. 757.20000)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Four)	Types 12BE6 Converter, 12AV6 Det.-AVC-AF Amp., 50L6GT Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles
RATING	.28 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1640KC

ALIGNMENT INSTRUCTIONS

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to antenna lug on tuning gang. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across Voice Coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	50MMF	High side to antenna coil. Low side to B-.	1640KC	"	"	A3	Adjust for maximum output.
3.	"	"	1400KC	Tune to 1400KC signal	"	A4	Adjust for maximum output while rocking tuning gang.

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PARTS LIST AND DESCRIPTIONS

SILVERTONE
MODEL 6018 (Ch. 757.20000)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT	
V1	Converter	12BE6	12BE6	
V2	Det. -AVC-AF Amp.	12AV6	12AV6	
V3	Output	50L6GT	50L6GT	
V4	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	E324	PRS150V804020	BBRT84215	TCT3117	TDL-804020-150	FMT-315	TVA-3455
B	30	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	1			NPO-S11	TCZ-1	TZ03	NPOA-010		5TCCB-V1	
C3	.05	400	E306	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C4A	220									
B	2000									
C	5000		♦ E3015	♦ PA-113-1	♦ PC-150	♦ 116TM1	♦ 1408-01		♦DT-1	
D	250									
E										
C5	.01	600	E301	BPD-01	D6-103	CUB6S1		PT611	6TM-S1	
C6	.047	400	E342	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C7	.05	400	E306	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	

♦ Items C4A, C4B, C4C, C4D, C4E, R5A R5B and R5C are combined in one unit. When replacing items separately, C4D and C4E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	E251	AB-76	A47-2Meg-Z	Q13-139	U-55	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A.

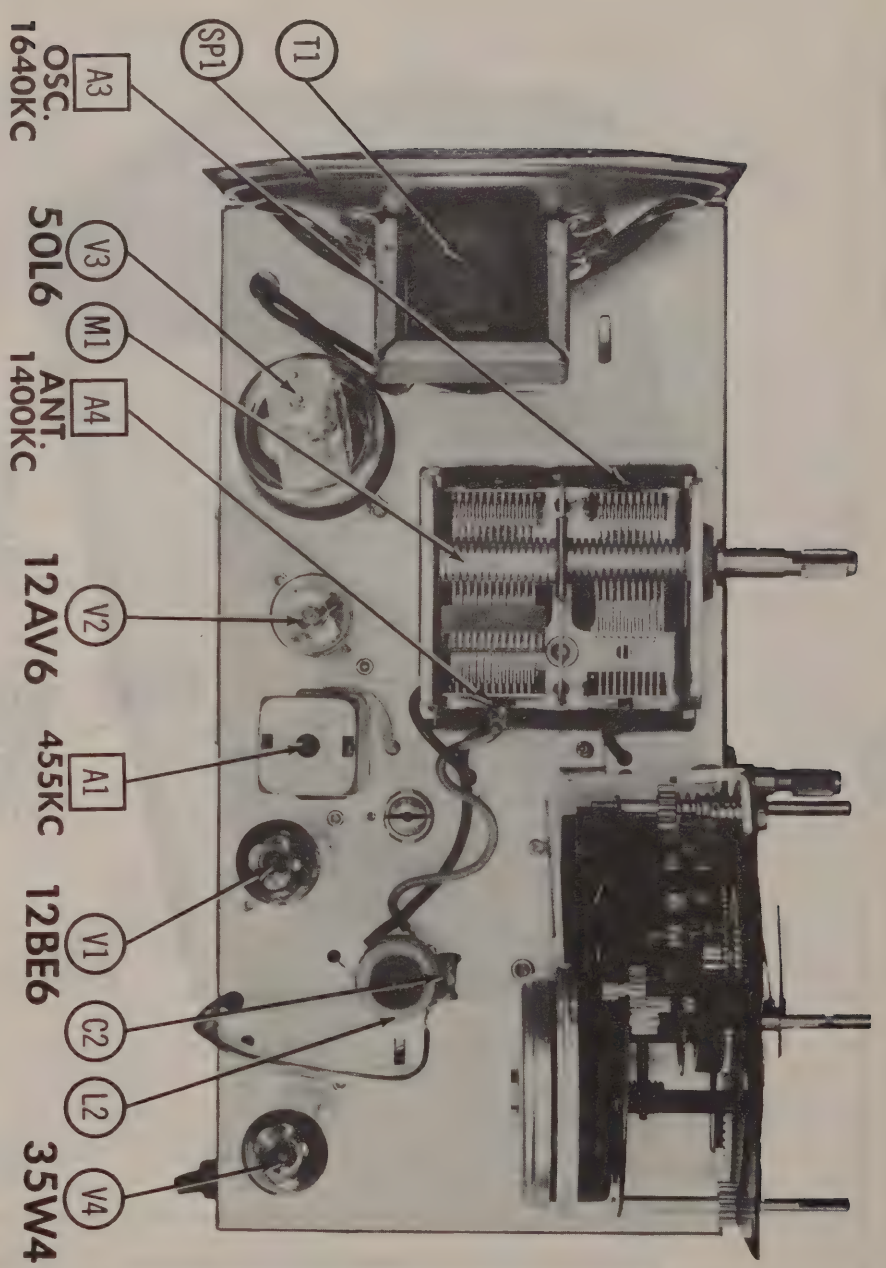
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	680Ω	½		BTS-680	
R3	22KΩ	½		BTS-22K	
R4	3.3Meg	½		BTS-3.3Meg	
R5A	6.8Meg			BTS-6.8Meg	
B	470KΩ		♦ E3015	BTS-470K	
C	470KΩ			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R6	120Ω	½		BTS-120	
R7	2200Ω	1		BTA-2200	
R8	22Ω	½		BTS-22	
R9	47Ω	2			

♦ Items R5A, R5B, R5C, C4A, C4B, C4C, C4D, C4E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.4KΩ	3-4Ω	Part of spkr.	Z1101	A3025	A3332	26S58 ①	S-12X	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	E103X	4A07	223S1	

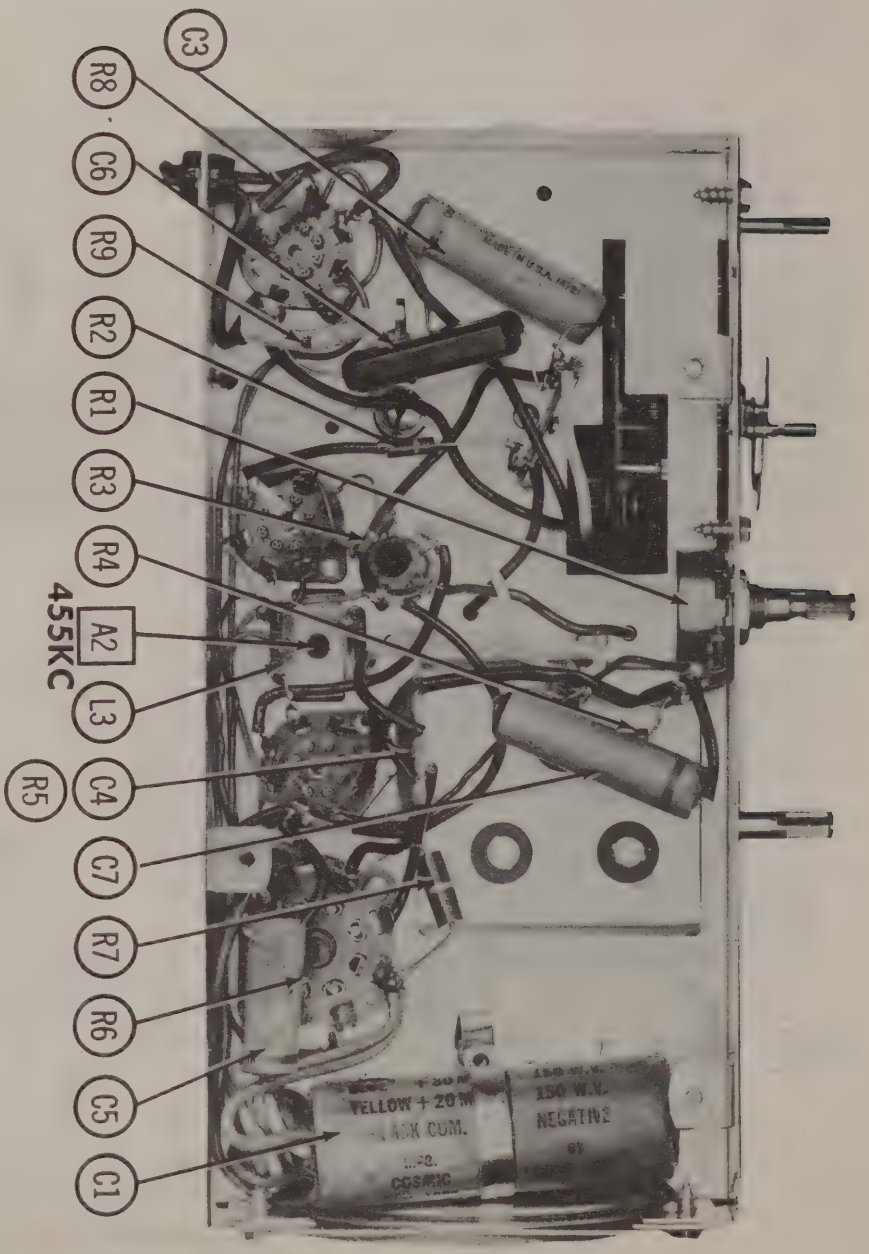
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	90Ω	2.9Ω	E615	14-1026	BC-380	72-A	
L2	Osc. Coil	.6Ω	5.5Ω	E618	14-1073		69-Osc.	
L3	IF Trans.	19Ω *	19Ω	E623				* Tapped ③ 2.5Ω

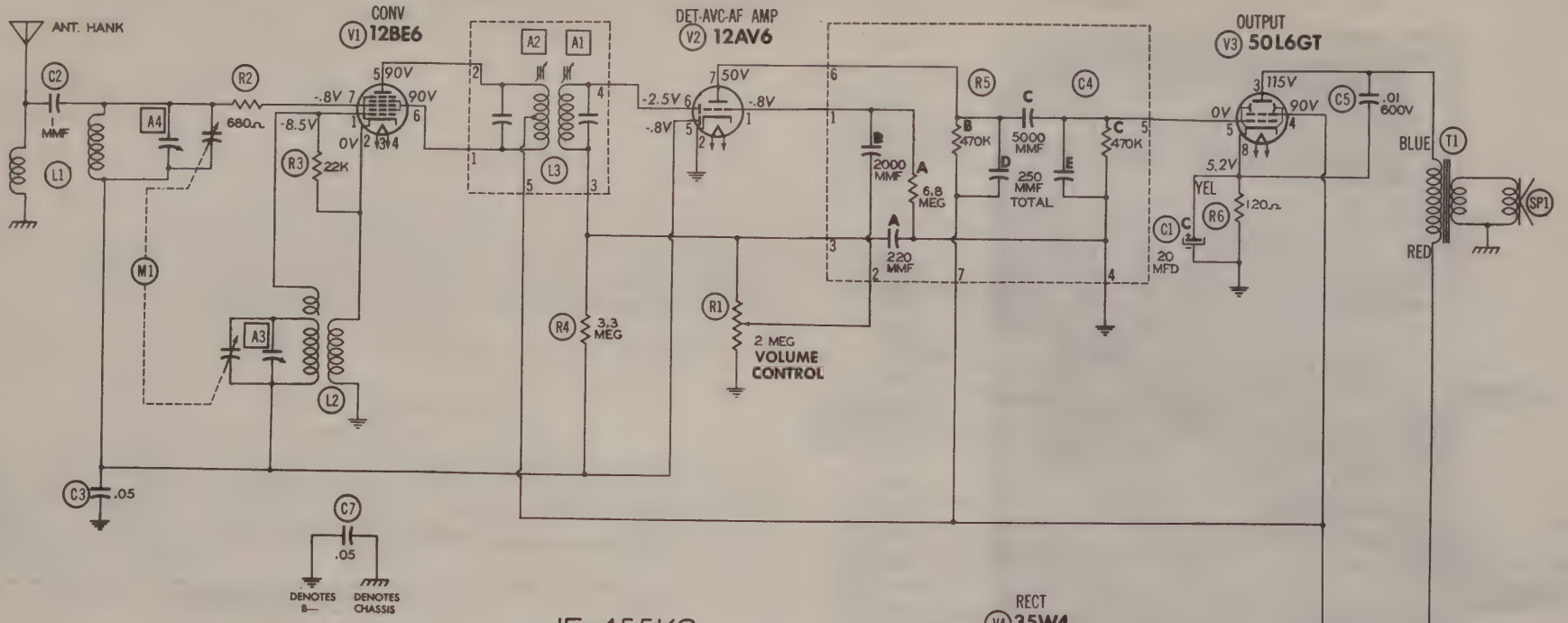
MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap.	E354	2 Gang (25-367MMF, 27-190MMF)
	Cabinet	E707BR	
	Knob	E508BR	Clock (3 used)
	Knob	E506BR	Selector
	Knob	E507BR	Volume

CHASSIS—BOTTOM VIEW

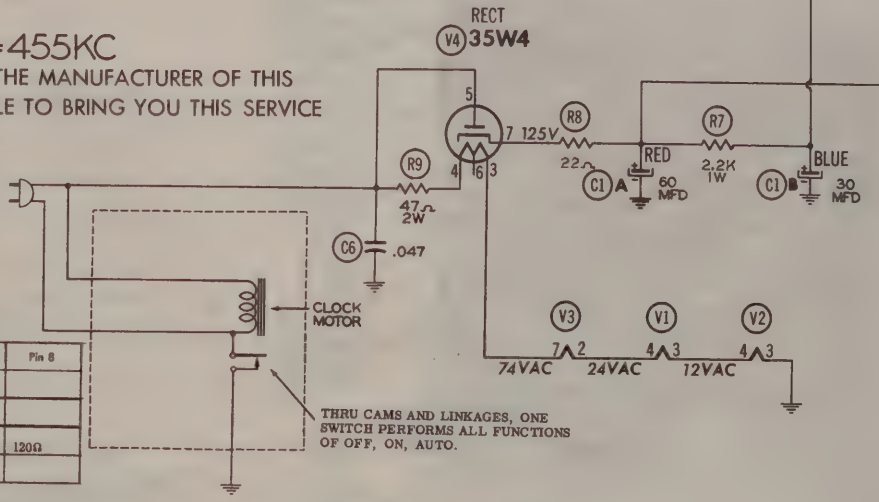


SILVERTONE
MODEL 6018 (Ch. 757, 20000)



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BE6	22KΩ	.5Ω	12Ω	24Ω	† 2.2KΩ	† 2.2KΩ	5.3Meg	
V 2	12AV6	6.8Meg	0Ω	0Ω	12Ω	5.3Meg	2Meg	† 472KΩ	
V 3	50L6GT	NC	24Ω	† 250Ω	† 2.2KΩ	470KΩ	TP	74Ω	120Ω
V 4	35W4	TP	TP	74Ω	109Ω	121Ω	100Ω	70KΩ	

† MEASURED FROM PIN 7 OF V4.
NC-NO CONNECTION.
TP-TIE POINT.

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SYLVANIA MODELS 515B, E, H, RE, TU, 519B, H, R, TU, 5151B, H, RE, TU (Ch. 1-607, -1, -2, -3)

SYLVANIA MODELS 515B, E, H, RE, TU, 519B, H, R, TU, 5151B, H, RE, TU (Ch. 1-607, -1, -2, -3)

SYLVANIA MODELS 515B, E, H, RE, TU, 519B, H, R, TU, 5151B, H, RE, TU (Ch. 1-607, -1, -2, -3)

TRADE NAME	Sylvania Models 515B, H, RE, TU (Ch. 1-607-1); 519B, H, RE, TU; 5151B, H, RE, TU (Ch. 1-607-2, -3)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Tel. Div., 254 Rano St., Buffalo 7, N. Y.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop (Radiated)	1650KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC signal	"	A6	"

L. F. BLANK
3924 MEADE ST.
DENVER, COLORADO

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PARTS LIST AND DESCRIPTIONS

SYLVANIA
Model 515B (Ch. 1-607-1)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT	
V1	Converter	12BE6	12BE6	
V2	IF Amplifier	12BA6	12BA6	
V3	Det. -AVC-AF Amp.	12AT6	12AT6	
V4	Output	50C5	50C5	
V5	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 70	150	161-2016	AFH2-19	XB004	FP216	TM-8040-150	D-085	R2202
B	▲ 30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	400	169-0021	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C3A	125									
B	5000									
C	5000		♦ 190-0021							
D	100									
E										
C4	.022	600	169-0022	BPD-02	DD-203	CUB6S22	817-02	PT6122	6TM-S22	
C5	.047	400	169-0021	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

♦ Items C3A, C3B, C3C, C3D, C3E, R7A, R7B and R7C are combined in one unit. When replacing items separately, C3D and C3E should total 100MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500KΩ	½	157-0041					Volume & Switch-See Note

Note: Model 519 Chassis 1-607-2 will use control Part No. 157-0043.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R2	22Ω	½	181-0220	BTS-22	
R3	22KΩ	½	181-0223	BTS-22K	
R4	3.3Meg	½	181-0335	BTS-3.3Meg	
R5	220Ω	½	181-0221	BTS-220	Note 1
R6	47KΩ	½	181-0473	BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R7A	6.8Meg		♦ 190-0021	BTS-6.8Meg	
B	470KΩ			BTS-470K	
C	470KΩ			BTS-470K	
R8	150Ω	½	181-0151	BTS-150	
R9	1200Ω	1	182-0122	BTA-1200	

♦ Items R7A, R7B, R7C, C3A, C3B, C3C, C3D, C3E are combined in one unit.
Note 1. Initial production uses a 100Ω ½W resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.6KΩ	3-4Ω	143-0045	Z1101	A3025	A3332	22S58	S-12X	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

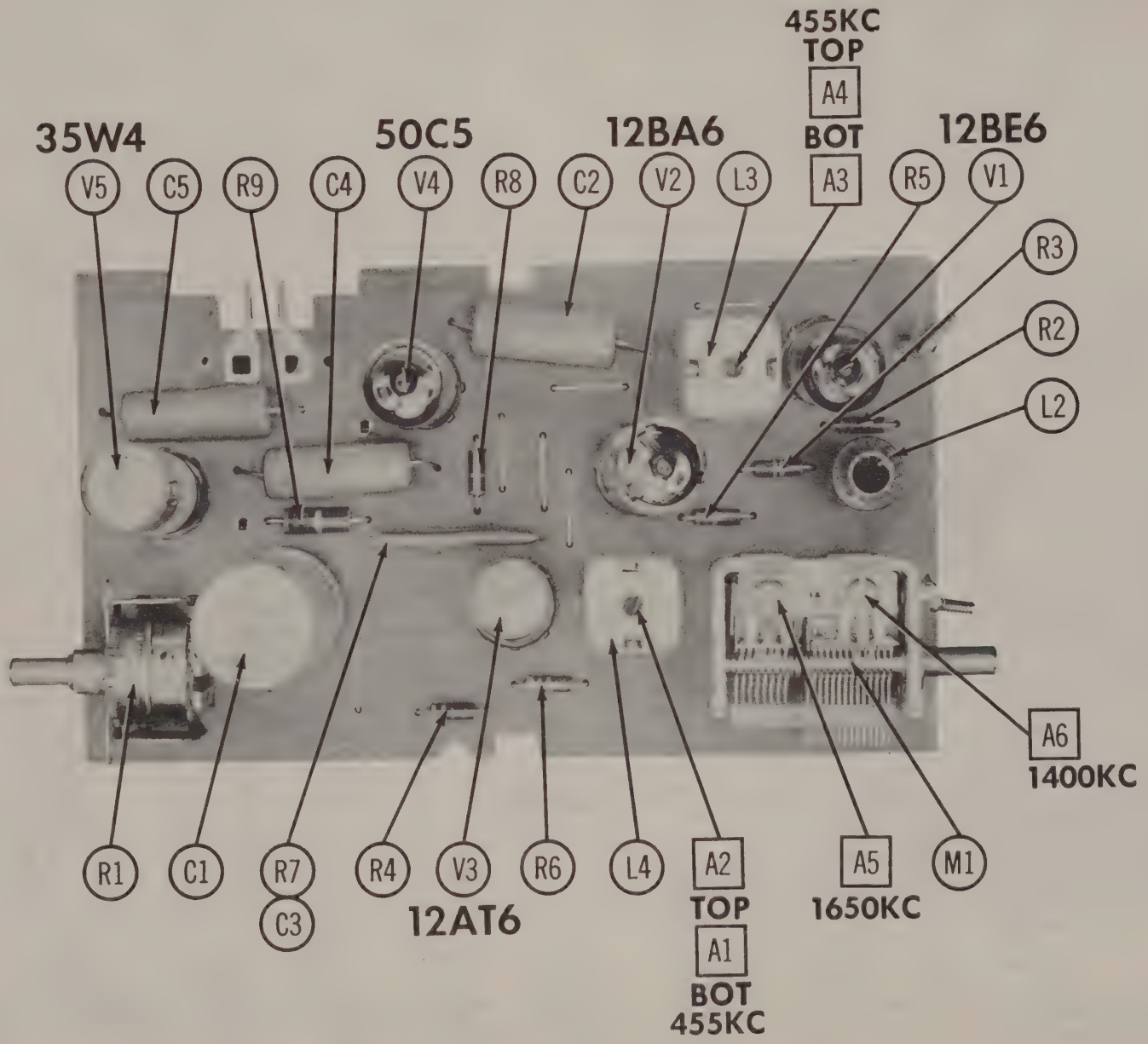
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	539-0404	4A07	223S1	

COILS (RF-IF)

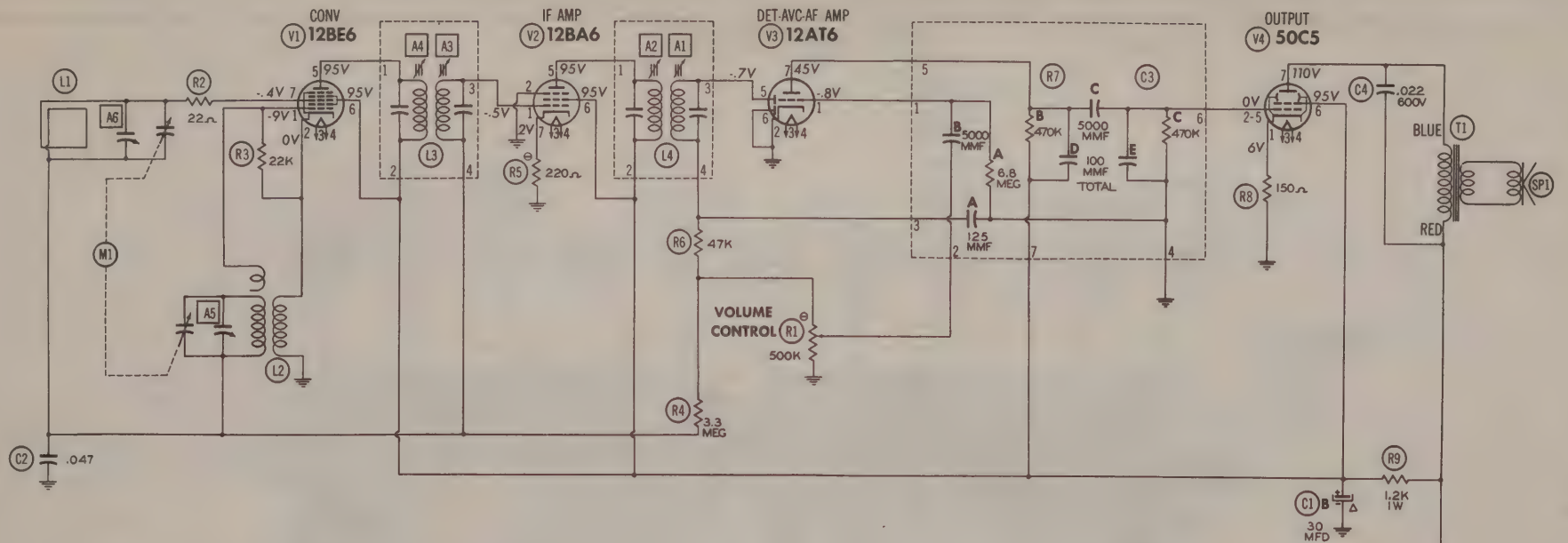
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.9Ω		582-0023				
L2	Osc. Coil	1.3Ω	8.3Ω	113-0032				
L3	Input IF	15Ω	15Ω	121-0027	16-6780		13-PC1	
L4	Output IF	15Ω	15Ω	121-0027	16-6780		13-PC2	

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M1	Tuning Cap.	170-0019	2 Gang-Models 515, 515I
	Tuning Cap.	170-0020	2 Gang-Model 519
	Cabinet	813-0064	Model 515B
	Cabinet	813-0067	Model 515H
	Cabinet	813-0065	Model 515RE
	Cabinet	813-0066	Model 515TU
	Cabinet	813-0073	Model 515IB
	Cabinet	813-0076	Model 515IH
	Cabinet	813-0075	Model 515IRE
	Cabinet	813-0074	Model 515ITU
	Cabinet	813-0069	Body-Model 519B
	Cabinet	813-0079	Body-Model 519H
	Cabinet	813-0077	Body-Model 519R
	Cabinet	813-0081	Body-Model 519TU
	Cabinet	813-0068	Front-Model 519B
	Cabinet	813-0080	Front-Model 519H
	Cabinet	813-0068	Front-Models 519R, 519TU
	Knob	740-0084	Tuning-Models 515B, 515IB
	Knob	740-0087	Tuning-Models 515H, 515IH
	Knob	740-0088	Tuning-Models 515RE, 515IRE
	Knob	740-0085	Tuning-Models 515TU, 515ITU
	Knob	741-0018	Tuning-Models 519B, 519H, 519R, 519TU
	Knob	740-0092	On-Off-Volume-Models 515B, 515IB
	Knob	740-0095	On-Off-Volume-Models 515H, 515IH
	Knob	740-0093	On-Off-Volume-Models 515RE, 515IRE
	Knob	740-0094	On-Off-Volume-Models 515TU, 515ITU
	Knob	740-0096	On-Off-Volume-Models 519B, 519H, 519R, 519TU



CHASSIS-TOP VIEW



IF=455KC

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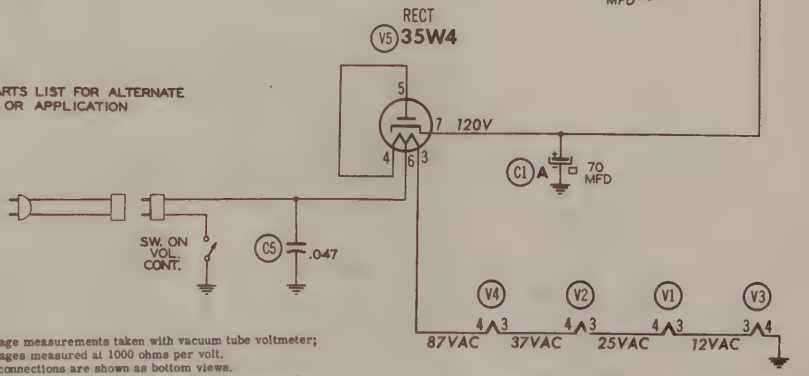

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22K	1.5Ω	15Ω	27Ω	† 1.2KΩ	† 1.2K	3.8Meg
V 2	12BA6	3.8Meg	0Ω	27Ω	58Ω	† 1.2K	† 1.2K	220Ω
V 3	12AT6	6.8Meg	0Ω	15Ω	0Ω	547K	0Ω	† 471K
V 4	50C5	150Ω	470K	58Ω	95Ω	NC	† 1.2K	† 200Ω
V 5	35W4	NC	NC	95Ω	130Ω	130Ω	120Ω	6KΩ

† MEASURED FROM PIN 7 OF V5.
NC-NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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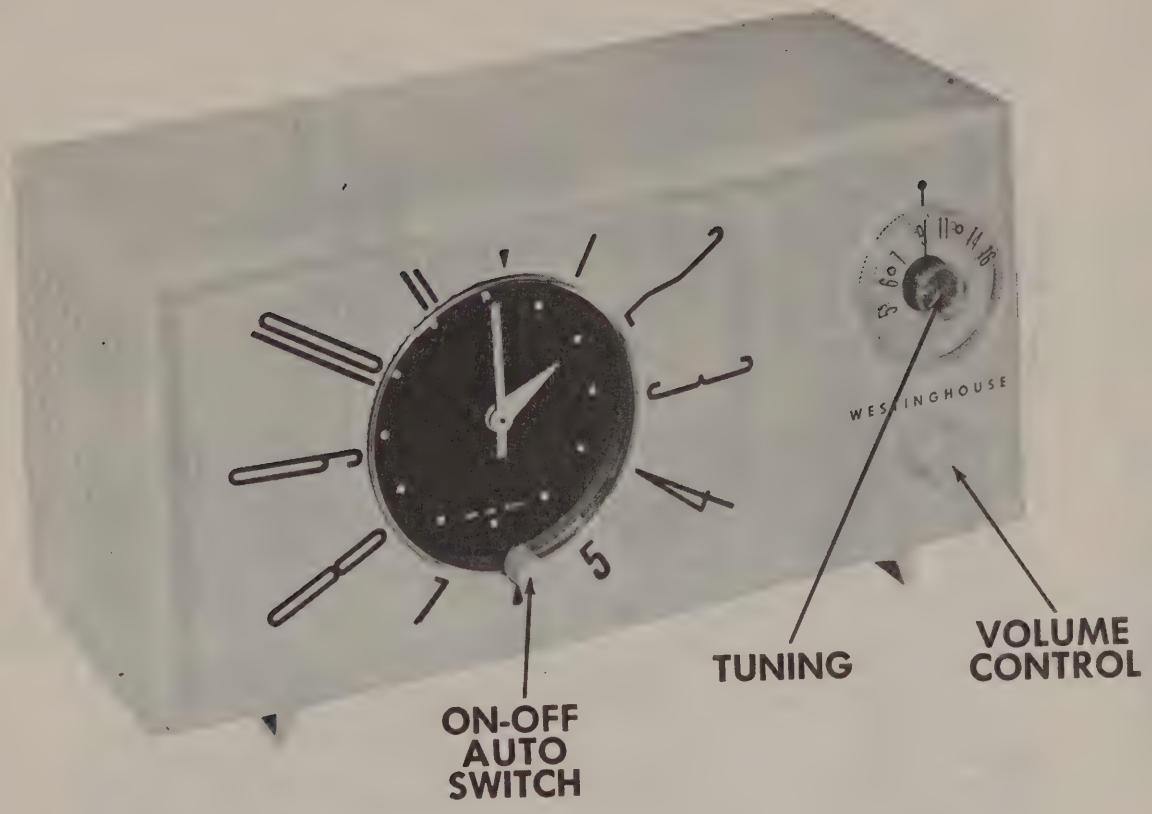
*TRADE MARK
RETMA MEMBER

WESTINGHOUSE MODELS H-541T5, H-542T5, H-543T5, H-544T5, H-545T5, H-546T5 (Ch. V-2259-1)

WESTINGHOUSE MODELS H-541T5, H-542T5, H-543T5, H-544T5, H-545T5, H-546T5 (Ch. V-2259-1)



WESTINGHOUSE MODELS H-541T5, H-542T5, H-543T5, H-544T5, H-545T5, H-546T5 (Ch. V-2259-1)

TRADE NAME	Westinghouse Models H-541T5, H-542T5, H-543T5, H-544T5, H-545T5, H-546T5 (Ch. V-2259-1)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amp., 12AV6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles
RATING	.25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to antenna stator lug. Low side to B-.	455KC	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1625KC	"	"	A5	"
3.		Loop (Radiated)	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det. -AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	V-16233-1	AFH2-16	XB003	FP214	TM-D50-150	D-070	TVL-2435
B	50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	10000		R2CC63Z5Z103P	BPD-01	DD-103	KO82	811-01	DC-511	5HK-S1	
C3A	220		♦ V-15542-1		♦PC-158					
B	5000									
C	5000									
D	250									
E										
C4	10000		R2CC63Z5Z103P	BPD-01	DD-103	KO82	811-01	DC-511	5HK-S1	
C5	.047	400	V-10157-4473M	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B and R5C are combined in one unit. When replacing items separately, C4D and C4E should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500KΩ	½	V-15767-3					Volume

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	22K	½	250V232A23	BTS-22K	
R3	150Ω	½	250V231A51	BTS-150	
R4	3.3Meg	½	250V233A35	BTS-3.3Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R5A	6.8Meg	½	♦ V-15542-1	BTS-6.8Meg	
B	470K	½		BTS-470K	
C	470K	½		BTS-470K	
R6	150Ω	½	250V231A51	BTS-150	
R7	1000Ω	1	250V331A02	BTA-1000	

♦ R5A, R5B, R5C, C3A, C B, C3C, C3D, C3E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.4KΩ	3.3Ω	Part of spkr.	Z1101	A-3025	A-3332	26S58 ①	S-12X	① Drill one new mtg. hole.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: Westinghouse PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM	3.3Ω	V-15557-1	4A07	223S1	

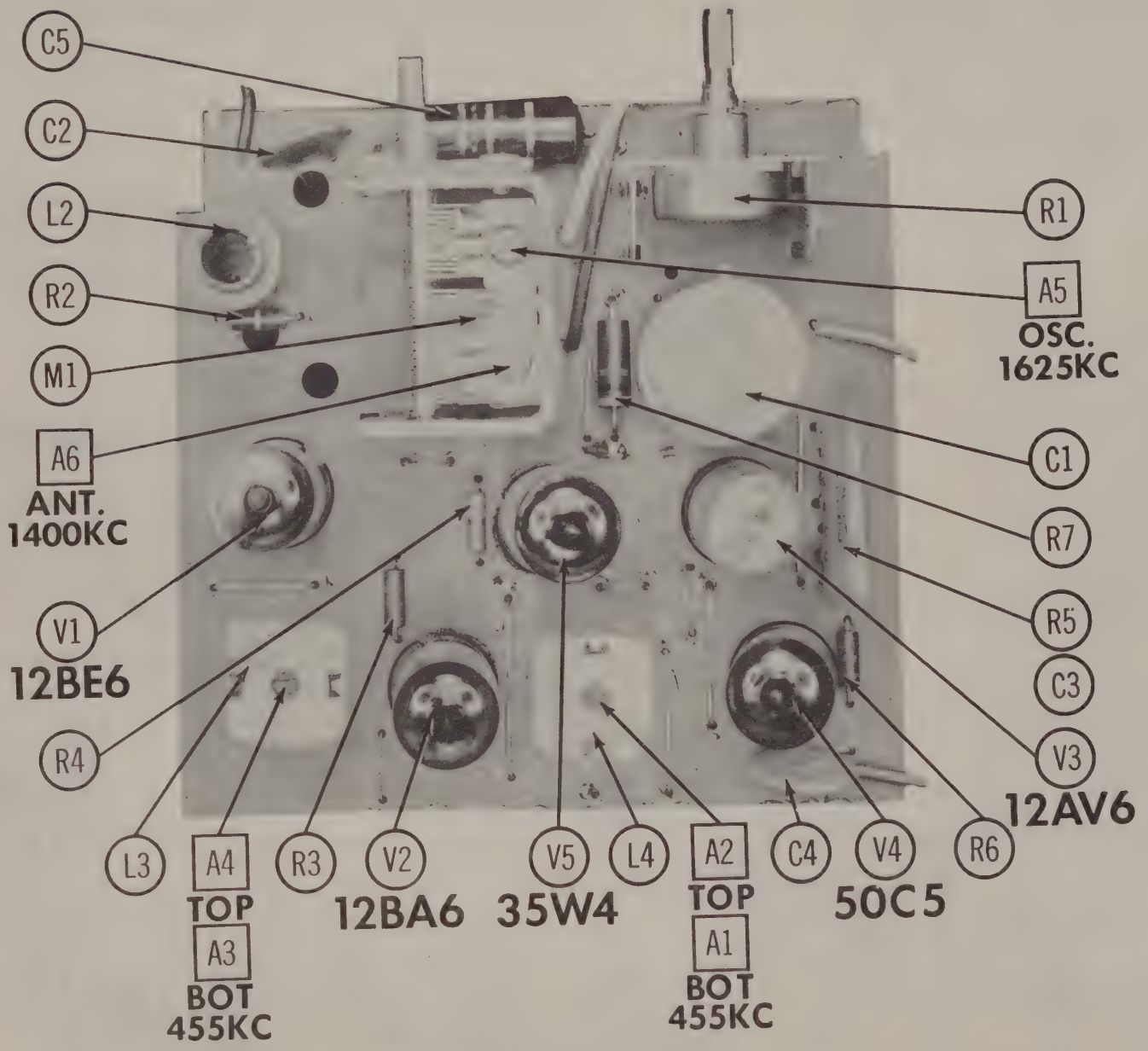
COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	4.9Ω		V-15841-2				Includes cabinet back-Note 1
L2	Osc. Coil	1Ω	12.5Ω	V-15752-3				
L3	Input IF	17Ω	17Ω	V-15547-1	16-6780	BC-352	13-PC1	
L4	Output IF	17Ω	17Ω	V-15547-1	16-6780	BC-353	13-PC2	

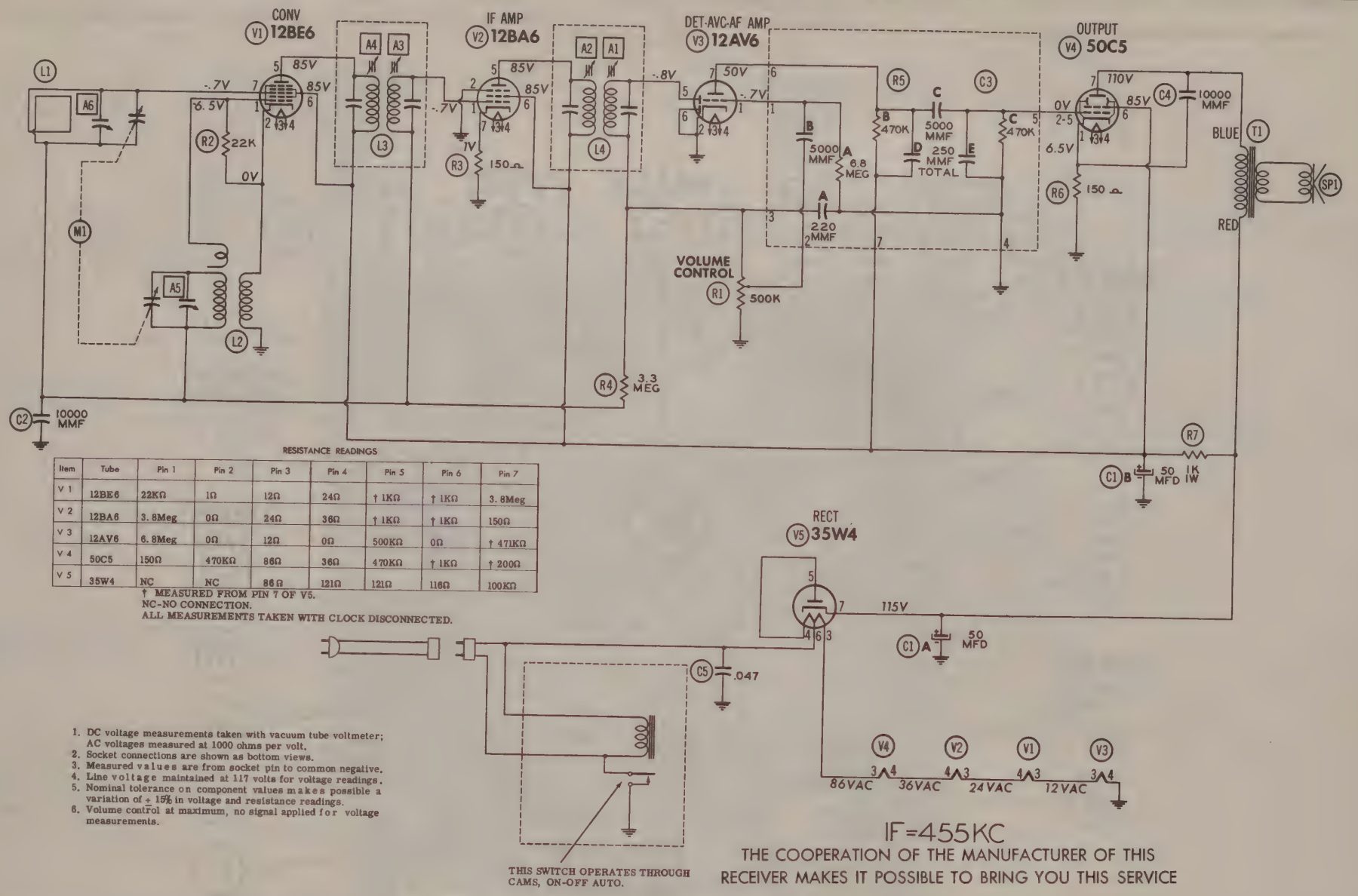
Note 1. Loop antenna Part No. V-15841-2 used in Models No. H-541T5, H-542T5 and H-543T5.
Loop antenna Part No. V-15841-1 used in Models No. H-544T5, H-545T5 and H-546T5.

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M1	Tuning Cap.	V-15969-1	2 Gang
	Cabinet	V-1436-6	Model H-541T5
	Cabinet	V-1436-1	Model H-542T5
	Cabinet	V-1436-2	Model H-543T5
	Cabinet	V-1436-3	Model H-544T5
	Cabinet	V-1436-4	Model H-545T5
	Cabinet	V-1436-5	Model H-546T5
	Knob	V-15759-4	Tuning-Models H-541T5, H-542T5
	Knob	V-15759-5	Tuning-Models H-544T5, H-545T5, H-546T5
	Knob	V-15759-6	Tuning-Model H-543T5
	Knob	V-14483-25	Volume-Model H-541T5
	Knob	V-14483-23	Volume-Model H-542T5
	Knob	V-14483-22	Volume-Model H-543T5
	Knob	V-14483-21	Volume-Model H-544T5
	Knob	V-14483-20	Volume-Model H-545T5
	Knob	V-14483-19	Volume-Model H-546T5
	Knob	V-16026-5	Clock (on-off-auto)Model H-541T5
	Knob	V-16026-4	Clock (on-off-auto Model H-542T5
	Knob	V-16026-1	Clock (on-off-auto) Model H-543T5
	Knob	V-11573-1	Clock (on-off-auto or alarm set) Models H-544T5, H-545T5, H-546T5
	Crystal	V-15922-1	Clock-Models H-541T5, H-542T5, H-543T5
	Crystal	V-15922-2	Clock-Models H-544T5, H-545T5, H-546T5



CHASSIS-TOP VIEW



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1Ω	12Ω	24Ω	† 1KΩ	† 1KΩ	3. 8Meg
V 2	12BA6	3. 8Meg	0Ω	24Ω	36Ω	† 1KΩ	† 1KΩ	150Ω
V 3	12AV6	6. 8Meg	0Ω	12Ω	0Ω	500KΩ	0Ω	† 471KΩ
V 4	50C5	150Ω	470KΩ	86Ω	36Ω	470KΩ	† 1KΩ	† 200Ω
V 5	35W4	NC	NC	86Ω	121Ω	121Ω	116Ω	100KΩ

† MEASURED FROM PIN 7 OF V5.
NC-NO CONNECTION.
ALL MEASUREMENTS TAKEN WITH CLOCK DISCONNECTED.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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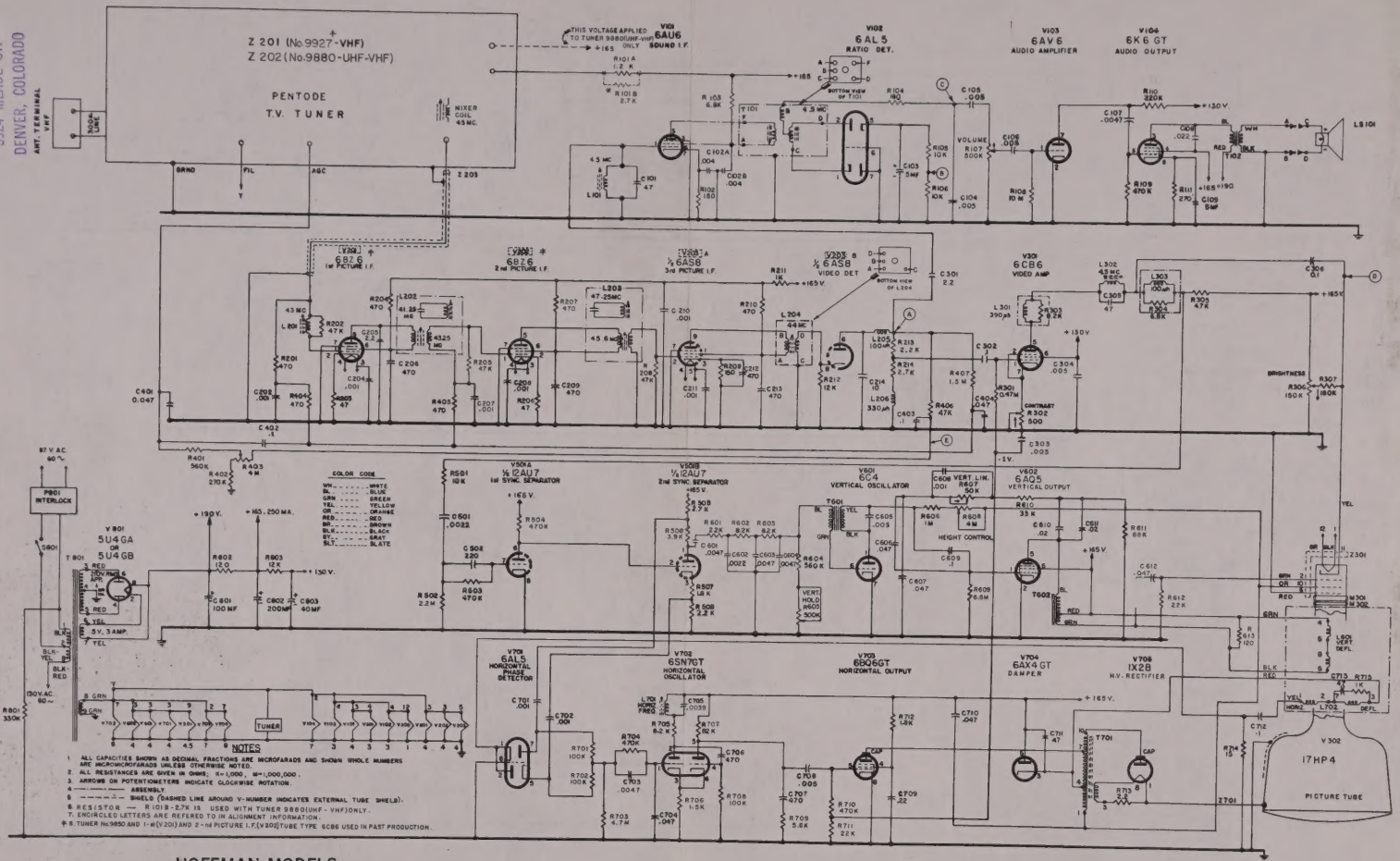
HOFFMAN

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO


Z 201 (No.9927-VHF)
Z 202 (No.9880-UHF-VHF)
PENTODE
T.V. TUNER
V101 6AU6 SOUND I.F.
V102 6AL5 RATIO DET.
V103 6AV6 AUDIO AMPLIFIER
V104 6K6 GT AUDIO OUTPUT
V201 6BZ6 1st PICTURE I.F.
V202 6BZ6 2nd PICTURE I.F.
V203A ½ 6AS8 3rd PICTURE I.F.
V203B ½ 6AS8 VIDEO DET
V301 6CB6 VIDEO AMP
V501A ½ 12AU7 1st SYNC. SEPARATOR
V501B ½ 12AU7 2nd SYNC. SEPARATOR
V601 6C4 VERTICAL OSCILLATOR
V602 6AQ5 VERTICAL OUTPUT
V701 6AL5 HORIZONTAL PHASE DETECTOR
V702 6SN7GT HORIZONTAL OSCILLATOR
V703 6BQ6GT HORIZONTAL OUTPUT
V704 6AX4 GT DAMPER
V706 1X2B H.V. RECTIFIER
V801 5U4GA OR 5U4GB
V302 17HP4 PICTURE TUBE
COLOR CODE
NOTES

HOFFMAN MODELS

B1007	(Ch. 315)	P1007	(Ch. 315)
M1007	(Ch. 315)	W1007	(Ch. 315)

Schematic Courtesy Hoffman Radio

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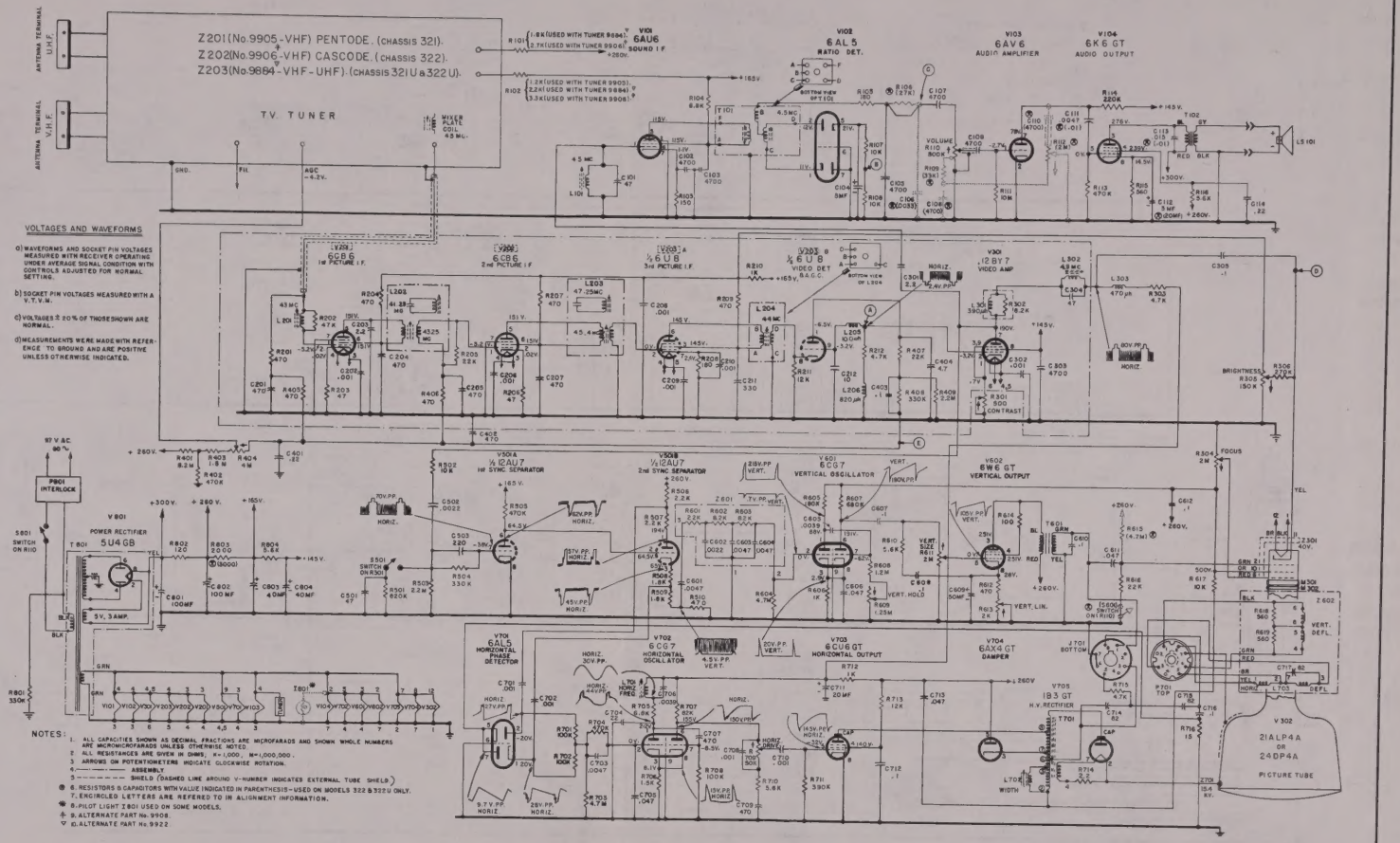
HOFFMAN MODELS

B1081 (Ch. 321)
B1091 (Ch. 321)
B1111 (Ch. 321)
B1121 (Ch. 322)
B3061 (Ch. 321)
B3071 (Ch. 322)
B3101 (Ch. 321)
B3114 (Ch. 322)
M1091 (Ch. 321)
M1111 (Ch. 321)
M1121 (Ch. 322)
M3061 (Ch. 322)
M3071 (Ch. 322)
M3101 (Ch. 321)
M3114 (Ch. 322)
P1121 (Ch. 322)
P3071 (Ch. 322)
P3091 (Ch. 322)
P3101 (Ch. 321)
P3114 (Ch. 322)
SP3061 (Ch. 321)
W1081 (Ch. 321)
W1111 (Ch. 321)
W1121 (Ch. 322)
W3061 (Ch. 321)
W3071 (Ch. 322)
W3101 (Ch. 321)
W3114 (Ch. 322)


Z201 (No. 9905 - VHF) PENTODE. (CHASSIS 321).
Z202 (No. 9906 - VHF) CASCODE. (CHASSIS 322).
Z203 (No. 9884 - VHF - UHF). (CHASSIS 321U & 322U).
TV TUNER
VOLTAGES AND WAVEFORMS
NOTES:
1. ALL CAPACITIES SHOWN AS DECIMAL FRACTIONS ARE MICROFARADS AND SHOWN WHOLE NUMBERS ARE MICROMICROFARADS UNLESS OTHERWISE NOTED.
2. ALL RESISTANCES ARE GIVEN IN OHMS, K=1,000, M=1,000,000.
3. ARROWS ON POTENTIOMETERS INDICATE CLOCKWISE ROTATION.
4. ——— ASSEMBLY
5. - - - - - - - SHIELD (DASHED LINE AROUND V-NUMBER INDICATES EXTERNAL TUBE SHIELD)
6. RESISTORS & CAPACITORS WITH VALUE INDICATED IN PARENTHESIS - USED ON MODELS 322 & 322U ONLY.
T, ENCIRCLED LETTERS ARE REFERED TO IN ALIGNMENT INFORMATION.
8-PILOT LIGHT I801 USED ON SOME MODELS.
9. ALTERNATE PART No. 9908.
10. ALTERNATE PART No. 9922.
V101 6AU6 SOUND I F
V102 6AL 5 RATIO DET.
V103 6AV6 AUDIO AMPLIFIER
V104 6K6 GT AUDIO OUTPUT
V201 6GB6 1st PICTURE I.F.
V202 6GB6 2nd PICTURE I.F.
V203 A ½6U8 3rd PICTURE I.F.
V203 B ½6U8 VIDEO DET. & A.G.C.
V301 12BY7 VIDEO AMP
V302 21ALP4A OR 24DP4A PICTURE TUBE
V501 A ½12AU7 1st SYNC. SEPARATOR
V501 B ½12AU7 2nd SYNC. SEPARATOR
V601 6CG7 VERTICAL OSCILLATOR
V602 6W6 GT VERTICAL OUTPUT
V701 6AL5 HORIZONTAL DIODE DETECTOR
V702 6CG7 HORIZONTAL OSCILLATOR
V703 6CU6 GT HORIZONTAL OUTPUT
V704 6AX4 GT DAMPER
V705 1B3 GT H.V. RECTIFIER
V801 5U4 GB POWER RECTIFIER
P801 INTERLOCK
S801 SWITCH ON R110
S501 SWITCH ON R301
117 V AC 60 ~
+260V.
+300V.
+165V.
5V. 3 AMP.
HORIZ. 30V. P-P
VERT. 180V. P-P
BRIGHTNESS R306 (B04)
FOCUS R304
VERT. SIZE R611 2M
VERT. HOLD R609 1.25M
VERT. LIN. R613 2K
HORIZ. HOLD R706 1.5K
HORIZ. FREQ. L705
VOLUME R110 500K
CONTRAST R301 500
HORIZ. WIDTH L707
VERT. DEFL.
PICTURE TUBE

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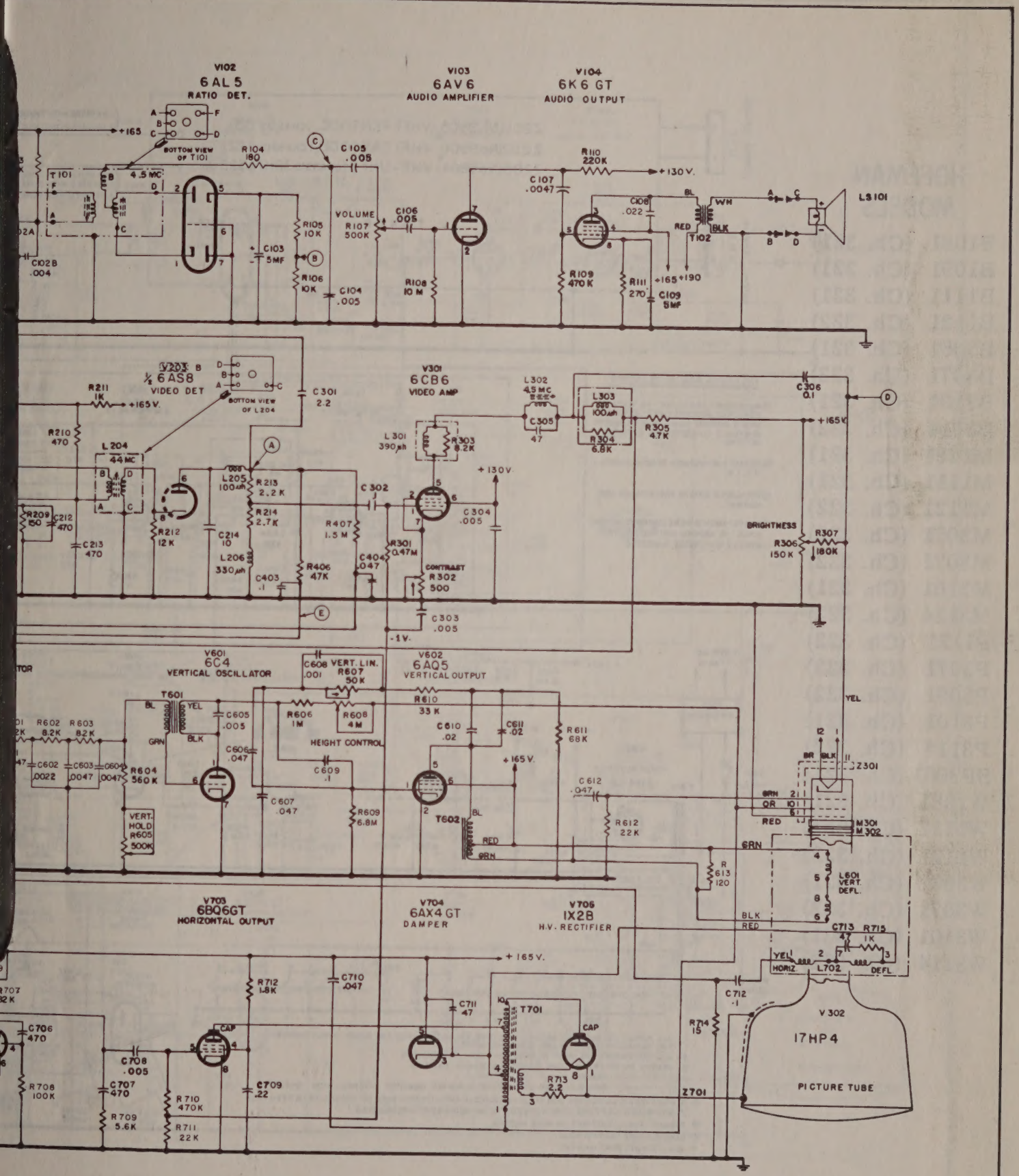

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